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ABSTRACT

A 1998 study conducted by researchers from the Centre For Learning and Work Research at Griffith Univ. and The Studies of Work, Education and Training, at Monash Univ. sought to evaluate the contributions of competency-based training (CBT) and assessment to Australian vocational education and training. "Introduction" (Stephen Billet, Fred Beven) summarizes the findings of the project's three subprojects. "Reform, Changes, and Transformation: A Commentary on the Implementation and Evolution of CBT" (Stephen Billet, Sharon Hayes) describes the institutional frameworks of the competency movement and vocational education. "Procedures for Data Gathering, Analysis and Integration of Subprojects" (Fred Beven, Sharon Hayes) details the sources and procedures used to gather data about CBT. "CBT as a Model of Curriculum Development" (Stephen Billet) discusses how the introduction of CBT influenced curriculum practice. "Assessment Practices" (Charlie McKavanagh) explores the assessment of expertise and methods of data analysis. "The Role of the Instructor" (Lawrence Angus, Terri Seddon, John Gough, Ian Robertson) traces the changing role of the instructor within CBT and CBT's trajectory and educational effects. "Findings, Conclusions, and Recommendations" (Stephen Billet, Fred Beven, Charlie McKavanagh, Sharon Hayes, Lawrence Angus, John Gough, Ian Robertson, Terri Seddon) discusses the three subprojects in the context of development of a flexible and adaptable work force and presents and recommendations emerging from the subprojects. The ten years since the introduction of a uniform system of CBT has seen significant improvement in the structure and organization of Australia's vocational educational system. To make further improvement, a change in

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emphasis in policy is needed to move beyond CBT and recognize the critical role teachers play in achieving the country's need for a flexible, adaptable and globally competitive workplace. (Contains 126 references, 24 tables/figures, 28.) (MN)

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THE CBT DECADE
Teaching for flexibility and adaptability

Stephen Billett
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1 Introduction

Stephen Billett and Fred Beven

The following chapters report a 1998 study undertaken by researchers at the Centre for Learning and Work Research at Griffith University and the Studies of Work, Education and Training academic team at Monash University. The study sought to evaluate the contribution of competency-based training (CBT) and assessment to Australian vocational education and training (VET). Three interrelated sub-projects dealing with curriculum development, assessment and teaching were undertaken to determine the extent to which CBT has been successful in securing governmental goals for VET.

This report is structured into seven chapters. This first chapter outlines the context for the project, its policy analysis and briefly outlines the findings. Chapter 2 provides an overview of the associated literature, focussing on both the expectations behind the initial implementation of CBT, and evaluations of that implementation over the last decade. Chapter 3 outlines the project's methodology, while chapters 4, 5 and 6 cover the findings of the separate projects. Chapter 4 is, therefore, a report of findings that focus on curriculum development. Chapter 5 reports findings concerning assessment issues and chapter 6 outlines the work completed in evaluating changes in teachers' practice. Finally in chapter 7, the findings and conclusions from each of these three chapters are synthesised into a set of key deductions and a set of recommendations for the future.

Background

The introduction of CBT in the late 1980s was driven by a concern to improve the flexibility and adaptability of the Australian workforce in order to make it more globally competitive (Dawkins 1988). This initiative was linked to micro-economic reforms aimed at improving aspects of work practice in Australia's public and private sector enterprises (Dawkins & Holding 1987). It coincided with a move to reform vocational education provisions nationally. A key governmental goal for this reform that emerged at this time, and which persists, was for VET to assume a key role in developing a workforce capable of competing against imports, and of producing competitive goods and services that are exportable. CBT was selected by government as the means to secure these goals and became linked with this reform movement. Significantly, behavioural approaches such as CBT have long been the preferred instructional model in Australia's vocational education systems. For instance, behavioural objectives, top-down models of curriculum development, and assessment against benchmarks have been used since the inception of technical and further education (TAFE) in Australia (Stevenson 1989). However, with the training reform movement of the 1980s came a tightening of the formula for curriculum development and implementation. This was achieved through the development and endorsement of national standards, the use of regulated accreditation frameworks and assessment practices. In all, these reforms changed the ways in which VET curriculum was developed and implemented, and students' performances assessed. For example, the reforms, while reflecting the existing criterion-based approach, reduced the multiple levels of assessment that were typically used (e.g. fail, pass, credit, distinction) to two levels of performance (competent/not competent).

Much of the reform activity was linked to key institutional re-arrangements in the late 1980s and early 1990s. This era saw the development of national competency standards, and moves towards national core curricula based on concerns for national uniformity and accountability. These national foci saw the emergence of key bodies such as the (now defunct) National Training Board (NTB), national curriculum committees (e.g. ACTRAC) and the establishment of the Australian National Training Authority (ANTA). It has been argued that such institutional re-arrangements required the use of CBT to manage and make instructional arrangements accountable to national regulation (Lundberg 1997). However, changes in institutional arrangements (e.g. the collapse of the 'Accord') and government policy (e.g. the emergence of enterprise-based industrial agreements) are now contributing to the erosion of national industrial awards and the rise of highly specific national curriculum arrangements. Concerns have been expressed that national prescriptions cannot effectively capture State, regional, local and enterprise requirements and needs. Consequently, some of the arrangements associated with the introduction of CBT are now being transformed. It is therefore timely to determine whether CBT secured the goals that were expected of it. The findings from such an evaluation should provide guidance for directions of change into the next millennium.

This project evaluated CBT in two States—Victoria and Queensland—in terms of the impact on the development and implementation of curriculum, judgements about students' knowledge, and its influence on the role of VET instructors. These concerns are addressed in three separate but inter-linked sub-projects, which together comprise National Research and Evaluation Committee (NREC) Major Projects 4, 5 and 6, which are combined in this research. These projects reflect three interrelated areas of educational practice: curriculum development (Project 4), assessment (Project 5) and instruction (Project 6). Integration of the projects has been achieved through a review of existing literature, followed by empirical work. This work comprises gathering consolidated data of differing kinds from teachers, representatives of industry, enterprises, students and documents associated with aspects of CBT policy and practice. In each State, the focus is on the same two industries: metals and hospitality. These industries were chosen because of their distinct profiles. On the one hand, the metals industry, which is predominantly trade-based, has been at the forefront of vocational education since its inception, while hospitality, a service industry, is a relatively new training field. By focussing on these diverse industries, it was hoped that a more comprehensive picture of the effects of CBT on vocational education would emerge as a result of our research. Data gathering and its analysis within these industries focussed on the investigation of the educational worth of CBT and its influence on educational practice across the three sub-projects.

Data were gathered in both metropolitan and non-metropolitan sites in Victoria and Queensland to reflect the diverse circumstances for the implementation and evaluation of this national initiative. In doing so, the importance of antecedent conditions was recognised because of the changing circumstances surrounding VET as it existed prior to CBT, and the circumstances and goals into which CBT was implemented. This analysis therefore seeks to understand contextual factors. For example, it maps the use of CBT and how that use differs across the two States. The different historical and contemporary developments in VET in Australian States and Territories makes it important that such research was conducted in more than one State. Therefore collecting data from two States was particularly useful in illustrating and examining the implementation of CBT policy. A decade ago VET was predominantly TAFE. Both Queensland and Victoria have had quite different experiences of vocational and post-compulsory education (e.g. in relation to the location of vocational education in separate secondary schools), and contemporary TAFE management is much more decentralised in Victoria than in Queensland. Moreover, although Victoria is more

geographically compact, that State has a much larger population and more diverse industrial base than Queensland. The reason for conducting the research in the two States, however, was not to make a direct comparison between them, but to use them as broad exemplars of regional differences within Australian vocational education. The use of non-metropolitan sources also aimed to include regional perspectives. These bases were examined against an emerging focus on VET as it closes on the year 2000, especially with respect to the first ten years of implementation of CBT, the emerging enterprise focus, the breadth of the VET sector, and its increasingly market-based provisions.

This kind of analysis is important for informing future VET policy and practice because it is necessary to understand both the circumstances under which CBT was introduced and the conditions that VET is likely to be called upon to address in the near future. Fundamental to this analysis, therefore, was an evaluation of the utility of CBT in addressing:

i) the knowledge required in Australian workplaces at the commencement of the next century

ii) the capacity of CBT to address the industry goal of a skilled workforce

iii) the capacity of CBT to satisfy enterprise requirements of developing skilful and adaptable employees

In addition to these purely economic goals are social goals for vocational education associated with individual aspirations and the needs of communities. It is important that these needs are also recognised and that evidence is tabulated to account for the individuals as well as the organisations that were affected by the recent changes in vocational education.

In sum, the purpose of the overall project was to seek an understanding of the contemporary and likely future requirements for VET curriculum development, assessment, and instruction, and to compare these with the antecedent conditions that where present at the time of the inception of CBT. The antecedent factors are therefore examined in each of the three sub-projects (see table 1 for a clear depiction of this integration). The processes used in curriculum development, implementation, assessment and instruction are also identified and evaluated, followed by an appraisal of the outcomes of the three areas of VET practice. Together, these three phases constitute the approach to evaluation devised by Stake (1976). A 'futures' phase was also adopted to point the way forward. Stake's three phases are depicted in table 1.1.

A decade of CBT

The move to implement a uniform system of CBT in the Australian vocational education system began in earnest in 1989 (Harris et al. 1995). The implementation followed a

Table 1.1: Antecedent conditions, processes and outcomes (adapted from Stake 1976)

Antecedent conditions (What was the existing situation?)	Approaches to curriculum development used.
	Approaches to student assessment and outcomes.
	Role of VET teachers.
Process interventions (CBT) (What processes were used?)	Processes and outcomes of CBT curriculum development.
	Assessment under CBT, its implementation and practice.
	CBT implementation by VET teachers and trainers.
Outcomes (What has been achieved?)	Success of CBT in meeting the needs of enterprises, industries and students (economic and social goals).
	Ability of CBA to furnish valid and reliable judgements.
	The integration of CBT into VET instructors practice.

policy-focussed debate about a more skilful ('clever') country and concurrent government support for bi-partite deliberations between some employers and some unions, and about reforms to this country's vocational education system (Dawkins & Holding 1987; Dawkins 1988). The policy debate focussed on concerns about the nation's declining economic standing and proposed a set of interrelated policy initiatives that aimed at securing a more skilful and productive workforce. Hence a platform of policies was developed aimed at reforming workplace practices, linking remuneration increases to enhanced skilfulness and at reforming the vocational education system. Baverstock (1996) suggests these reforms were responses to negative international appraisals of the nation's performance in the field of education and training. Within the platform of reforms was orthodoxy, associated with perceptions of failure on the part of the education system, and the need for greater responsiveness to industry. This orthodoxy was aligned to changes in views about economic orientations which emphasised the market and private good as a precursor or super-ordinate to the common good and which were adopted by a federal Labor government. Indeed, overseas influences were seen to be important and it was a bi-partite (industry/union) overseas study tour that resulted in the publication of *Australia Reconstructed* which set up the basis of many of the reforms that followed. Successive governments from both sides of politics have supported many of these reforms.

The particular aim of the reform was to establish the nation's vocational education system in order to develop a more flexible and adaptable workforce; one that would be globally competitive. This goal required reform to workplace practices as well as to the way skilled workers were prepared and assessed (Dawkins & Holding 1997). To remedy perceived deficiencies in the existing provision of vocational education courses, CBT was proposed as a vehicle that could:

i) quantify exactly what skills industry needs

ii) address problems associated with time-serving vocational education and training arrangements (particularly those associated with entry-level training and apprenticeship)

iii) permit the organisation and administration of vocational education to be closely linked to industry needs and, in particular, the reform of work practices referred to at the time as Award Restructuring (Dawkins 1988)

This process included aligning vocational educational provisions with restructured industrial agreements, thereby placing vocational education in a parallel role to industrial relations reform. This trend has continued, and is evident most recently in the linking of VET provisions with enterprise bargaining agreements. The 1989 decision to implement a uniform national CBT approach to VET, therefore, was founded on the belief by government and 'industry' that developing a skilled workforce through a centrally controlled and industry-mandated nationally uniform provision of VET ought to be the prime impetus for training. It was proposed by government and supported by its bi-partite collaborators in industry and the unions that such a move would enhance the quality of the Australian vocational education system. Because of industry support, the nation would see an increase in the commitment by enterprises to vocational education (Dawkins 1988; Harris et al. 1995). The federal Labor government invoked financial arrangements that resulted in tying funding for the States and Territories to their compliance to nationally uniform prescriptions (Lundberg 1997). Hence, goals for increasing both the quantum and quality of vocational education were to be realised through the uniform adoption of CBT. However, since 1989, much has changed in policy settings, goals for microeconomic reform, governing political parties and the structure and organisation of the nation's vocational education system. In sum, the institutional context within which CBT was to realise its goals has not been consistent or unidirectional in the last decade.

Consequently, an inquiry into the contribution of competency-based training and assessment to Australian VET has to go beyond comparing initial policy intents with outcomes. Rather, there is a need also to delineate the social, political and policy context within which CBT was introduced and to describe how this context has been transformed since 1989. In evaluating the contribution of CBT to Australian VET, judgements need to account for the contextual and institutional factors, policy goals and curriculum practice that have developed and subsequently been transformed over the 'decade of CBT' (1989–1998). It is therefore necessary to determine how and why new institutional frameworks, which shape the nature of curriculum and the work of instructors, have been established. Taking an institutional perspective, institutions, such as the VET systems, are seen as sets of regulatory norms that give rise to patterns of action. In this way, institutions constitute the social infrastructure that orders the behaviour of relevant social actors (both individuals and groups) and organises relations among them (Research School of Social Sciences 1995). This lends itself to a consideration of the relationship between CBT and the changing social context within which it has to interact and, indeed, CBT's contribution to changing the norms of the culture.

Given the potential scope of this project it is important to establish initially some clear parameters for discussion. The overall question for the investigation is: How useful has competency-based training been as a model of curriculum development, assessment and instruction in securing the governmental goal of developing an adaptable and flexible workforce?

The research question focusses on whether the three areas of curriculum practice and development, assessment, and teaching practice, have secured the key economic goal of developing a skilful and adaptable workforce capable of making Australia both import-competitive and successful in exporting its goods and services. This question suggests a basis for evaluating the contribution of CBT that is consistent with what was proposed by its governmental sponsors. This outcome might be stated as: What evidence is there that CBT has contributed to the development of an Australian workforce which is adaptable and flexible? This question focusses on the utility of CBT (its educational worth) and also invites consideration of its impact on institutional practice within the vocational educational system(s).

The particular focus of this investigation of the contribution of CBT is therefore found within three separate but interrelated areas of inquiry. These are the:

- ❖ efficacy of CBT as a model of curriculum
- ❖ utility, reliability and validity of a competency-based system of assessment
- ❖ influence of CBT on instructors' practice

In achieving this, it is necessary to capture the changing institutional context into which CBT has been implemented and its impact on changing institutional rules. CBT's contribution to the development of skilfulness[1] is the overall concern of the project as proposed in the central research question. However, the resolution of this question requires an appreciation of whether the implementation of CBT has changed institutional practice in ways that are consistent with this goal. In sum, the investigation has to identify the influence of CBT upon three interrelated areas of curriculum practice in terms of its impact upon (a) changes in institutional practice as well as its (b) achievement of the educational goals for which it was proposed. These lines of inquiry are richly interrelated. The three associated sub-questions are:

i) In what ways has the CBT model of curriculum been able to address the needs of industry and enterprises and the aspirations and needs of Australians in VET?

ii) How have competency-based assessment practices been able to furnish information about individuals' achievements against benchmarks, thereby permitting judgements about student performance, credit and prior knowledge?

iii) How has the implementation of CBT influenced the practice of instructors in VET?

Table 1.2 shows how these three strands of the project are linked.

These questions consider whether the CBT approach to curriculum is able to address the needs of 'industry' (which was its original intention see Dawkins 1988), enterprises (with the emerging focus on particular workplace sites), and individuals who aim to realise their aspirations through vocational education. Industry is taken to be the voice that speaks on behalf of, and advocates the interests of, an industry sector (e.g. members of industry training advisory bodies (ITABs), industry case loaders, and curriculum officers).

However, these voices often appear to have a different focus from those within enterprises (Billett & Hayes 1998). It is *enterprises* who actually employ, engage in productive or service tasks, and who may sponsor their employees' vocational education and training. The 'industry' perspective has concerns with the quantum of skilled workers and the quality of their preparation. These concerns include the provision of nationally-consistent courses able to develop the knowledge which permits those who are employed in industry sectors to respond to the demands of enterprises, but also to move across enterprises in that sector. Industry is concerned with the overall level of skilfulness required to maintain and develop a particular industry sector. Enterprises, however, want workers whose skilfulness is able to address their existing and emerging challenges (Carnevale 1995, Rowden 1995, 1997). Recent work has indicated that enterprises want two levels of customisation of VET programs to meet their particular needs. Firstly, they want the curriculum to be customised to their industry by creating a range of modules from which they can choose those that pertain to their workplace, and secondly they want the modules themselves to be made more workplace-specific (Billett & Hayes 1998). Consequently, there are likely to be quite different outcomes required by particular enterprises, and these themselves are likely to be different in some ways from what 'industry' wants. Moreover, it seems the concerns of enterprises are now displacing those of industry in governmental priorities, with the new Training Packages aimed at satisfying enterprises' requests for customisation. The needs of individual Australians who participate in VET are now displaced in arrangements that focus on industry and enterprise needs. However, individual needs are now being viewed as more legitimate (Billett & Hayes 1998). Individuals have personal and occupational goals and require knowledge, which is robust enough to permit them to find employment and secure those goals. Of these interests, the bi-partite 'industry' voice is the one that has been most co-opted by government to advance (and occasionally modify) its views, policy and the implementation of practices determined by these policies.

The first sub-question is linked to curriculum development and raises issues of institutional practice and educational worth. So the focus here is on how curriculum practice shaped by CBT has been able to secure for individuals the knowledge required for flexible and adaptable performance.

The second question focusses on assessment. The ability of assessment practices under a competency-based system to identify, define and utilise appropriate benchmarks to advance reliable and valid judgements is of concern to students, employers, course accreditation bodies and the vocational education system more generally. In particular, the feasibility of assessment practice to assess and determine whether individuals

Table 1.2: Linking three strands of project

	Development and implementation of curriculum (Project #4)	**Assessment procedures (Project #5)**	**Role of VET instructors (Project #6)**
Phase A—Literature review	Comparing other models Reviewing existing literature	Comparing CBA with other approaches to assessment	Identifying role of instructors in instructional programs
Phase B—Antecedent conditions (What was the existing situation?) Empirical work in industry, enterprises and VET institutions	Approaches to curriculum development in use and their outcomes	Assessment approaches in use and their outcomes	Role of instructors and their consequences
Phase C—Processes (What processes were used?) Empirical work in industry, enterprises and VET institutions	Evaluation of development and implementation of CBT VET programs	Validity and reliability of assessment across industries	Staff development support for CBT implementation Quality of CBT implementation
Phase D—Outcomes (What was achieved?) Empirical work in industry, enterprises and VET institutions	Success in meeting the requirements and needs of enterprises, industries, instructors and students	Ability of CBA to make judgements about students' performance, credit and prior knowledge in VET institutions and workplaces	Understanding of CBT by VET instructors Performance of CBT across settings and institutions
Phase E—Analysis and refinement Advice from industry, enterprises and VET institutions	Analysis of antecedents, processes and outcomes Refining that analysis	Analysis of antecedents, processes and outcomes Refining that analysis	Analysis of antecedents, processes and outcomes Refining that analysis
Phase F—Finalising report	Writing report Integrating with findings, deductions and recommendations from #5 and #6	Writing report Integrating with findings, deductions and recommendations from #4 and #6	Writing report Integrating with findings, deductions and recommendations from #4 and #5

have the knowledge required to be flexible and adaptable is pertinent to the overall governmental goals. The Employment and Skills Formation Council (1988) claimed it is possible to discern difference in the quality of performance through competency-based assessment (CBA). Concerns about assessment inform several dimensions of the investigation, its educational worth, and influence on practice, that is, the degree to which changes have occurred in assessment practices, and whether CBA can furnish valid and reliable judgements about individuals' learning of the vocational knowledge required for skilfulness.

The third question addresses the degree to which the implementation of CBT has actually changed the practice of instructors within VET. Issues about the transformation of institutional arrangements and, in particular, ways in which externally mandated aspects of practice are likely to be adopted by both novice and experienced vocational instructors are the concern here. It also addresses the issue of whether CBT influenced practice in ways that are likely to develop the knowledge required for skilfulness.

These areas of interrelated inquiry require two levels of analysis:

i) to make judgements about CBT and to understand the changing institutional context within which it was implemented

ii) to determine whether the effects of CBT on curriculum practices are likely to result in developing in students the adaptability necessary for a future workforce; in other words to make an assessment of its educational worth

The final sections of this chapter provide a brief overview of the findings from each of the sub-projects, a summary of these findings and a summary of the recommendations made.

Overview of findings: Sub-projects

The impact of CBT on curriculum processes

Industry needs and the CBT model of curriculum

- Changes were made to the curriculum development processes to directly respond to industry needs.
- Outcomes of the curriculum development process were changed from an 'internal' VET focus to one focussing upon industry/enterprise needs.
- The role of industry in the determination of intents and content (the *intended curriculum*) was given precedence over the role of teachers.
- There has been an institutionalisation of industry/enterprise involvement in the curriculum development processes (ITABs).
- Measures have been implemented to secure teachers' industry currency (accreditation).
- There is evidence that current VET provisions are securing adaptable industry outcomes.
- Uniformity has not been achieved through the CBT model of curriculum, nor is it likely to be achieved.
- A reliance on curriculum use and accreditation processes to secure responsiveness appears to be flawed, as they have failed to secure commitment.
- The use of uniform industry standards appears not to always reflect the needs of enterprises.
- The use of specific behavioural objectives and detailed standards in curriculum are not securing adaptability and flexibility amongst learners.

- Instructional processes, activities and means of engaging students, rather than specified outcomes and industry standards, have been identified as the means for developing robust industry knowledge in students.

Enterprise needs and the CBT model of curriculum

- Interactions between enterprises and providers help to develop an understanding of enterprise needs.
- Providers are responding to external mandating (e.g. teachers' currency, improved access, work-based learning).
- The customisation to enterprise need is becoming evident across providers.
- Student competence is now increasingly being seen as relevant to the workplace.
- CBT has not itself provided an approach to instruction that can deliver skilfulness and adaptability in the form of multi-skilling.
- Instructional activities in classroom and workplace (e.g. project work, group activities, teacher-guided activities and self-managed activities) are seen as critical in the development of skilfulness and adaptability.
- The need for a greater consideration of learning experiences that deliver competitiveness and multi-skilling is emerging as an issue.
- With the exception of sourcing the intents and content of the curriculum externally, CBT itself has not delivered the majority of enterprise needs.
- There is little evidence that CBT itself has improved competitiveness.

Individual needs and the CBT model of curriculum

- The relevance of courses and outcomes is important if students are to develop transferable knowledge.
- Interactions between providers and enterprises help develop relevance.
- The lack of relevance in course content to workplace activities is a key concern for some learners.
- An ability to transfer basic knowledge from the classroom to the workplace is necessary and needs to be developed.
- The currency of teachers' knowledge is seen as crucial.
- Some learners favour opportunities for individualised learning.
- Some learners believe that resource-based learning and self-pacing inhibits learning, particularly when teacher support is lacking.
- Dissatisfaction with quality of the teaching/learning experience is a common complaint.
- There is limited evidence that CBT has resulted in increased skilfulness.

The impact of CBT on assessment practice

Since assessment (and the results and credentials which arise from it) is a prime motivator of staff and student activity, its control is also a powerful manager of change. The CBT movement has placed great emphasis on changing assessment practices to make them more uniform nationally and to ensure that these practices conform more rigidly with perceived industry needs as defined in competency standards. Despite this move for conformity, chapters 4 and 6 of this report demonstrate that curriculum design and teachers' practices retain a degree of diversity. While practices differ, the issues that surround assessment under CBT show a greater degree of uniformity across industries and States than for curriculum development or teaching. The findings for this sub-project can be summarised as follows:

- *Incentive*—Non-graded passes are seen as de-motivating by many students (and especially better students), teachers and employers, whereas high incentives to commit to learning are required to develop expertise.
- *Practice and Understanding*—There has been a de-emphasis on theory and a re-emphasis on practice in assessment. This has increased opportunities for the development of routine skills but limited opportunities to apply and extend those skills in combination with theoretical concepts. Less tangible aspects of assessment such as attitudes and 'common sense' also tend to be neglected.
- *Authenticity*—The focus of assessment is on demonstrated competence in action and is more closely linked to 'real life' situations of work and more focussed on specific workforce needs.
- *Complexity*—There is little evidence in the data of assessment of problem-solving and creative abilities. Clearly this is of concern for workplaces which are under more or less constant change and where new products, new practices and new technology are being introduced at an increasing rate.
- *Integration*—The partitioning and assessment of learning into small modules is unlikely to bring about integration of knowledge that is required for expertise. More holistic, global and integrating assessment that accumulates within and across modules is called for.

The impact of CBT and teachers' practice

CBT has had a profound effect on the practice of instructors, but the effect in many cases has been indirect rather than direct. Moreover, an individual's assessment of the impact of CBT is dependent on how the individual views the role of instructors. An important finding in this respect, in relation to the sample of TAFE and non-TAFE instructors who were interviewed for this project or who took part in focus groups, is that respondents tended to regard themselves as 'teachers' not 'instructors'. Such self-labelling is important to participants, they claimed, because the label 'instructor' implies a narrower role and range of professional duties than does the term 'teacher'. To them, the term instruction means face-to-face teaching and monitoring of students. Teaching is something much more complex and involves a wide sweep of activities that require the exercise of professional judgements and engagement with students, colleagues and stakeholders. Indeed, the distinction made between these two terms in many ways summarises the range of concerns that many participants, including some industry representatives and curriculum personnel, express about the impact of CBT on the role and practice of teachers. The range of concerns is summarised as follows:

Changes to instruction

- Since 1989 there has been a lack of input of educators into curriculum and assessment design.
- CBT encourages the measurement of specific aspects of learning that can be seen, in some respects, as disconnected from teachers' relatively holistic conception of teaching.
- CBT is often perceived as something akin to an administrative technology, a framework for VET delivery in purely behavioural terms, which leads to inappropriate restrictions in teaching practice.

Teachers' role

- CBT is associated with the production of specific knowledge (in the form of facts and know-how) and specific behaviours. However, respondents strongly held that outcomes of teaching and learning ought to be viewed in terms of 'process outcomes'.

- Teachers felt that the most important aspect of teaching and learning ought to be the development in students of the capacity to learn how to learn throughout their careers and their lives. Promoting such capacity was seen as the work of teachers not instructors.
- Changes that have occurred in teachers' practice since 1989 are viewed by them in terms of degree, rather than kind.

Teaching methods

- Diversification of teaching methods has occurred since the introduction of CBT with a shift away from teacher-centred instruction.
- Shifts have occurred from college-based face-to-face teaching, guided by the curriculum, to methods that place an increased emphasis on assessment.
- There has been an increased responsiveness by teachers to industry and enterprise needs with an expansion of workplace delivery and assessment.
- Teachers have noticed an increased need for student support.
- Less importance is placed on the need for teachers to use their professional judgement. This limits the range of teaching practices teachers use and the nature of their relationship with students in particular.

Impact on students/trainees

- The introduction of CBT has restricted the relationship between teachers and students.
- Limited conceptions of the role of the teacher that are associated with CBT have resulted in different learning outcomes.
- Some teachers have noticed different and less personal social and educational formation of students.
- Too much emphasis on self-pacing and text-based materials has distanced students from their teachers.

Impact on teachers' work

- There is intense pressure on teachers to deal with change.
- An increase in sessional and contract employment has led to a decline in common understandings about good practice in teaching and standards of performance.
- Teachers feel that their special skills do not lie just in their vocational knowledge but in their skills and relationships as teachers.

Summary of findings

The findings may be summarised as follows:

Comparisons between regions and industries in the application of CBT were complex because of:

- the difficulties in separating CBT from other influences
- the different bases that were used for the introduction of CBT nationally

Overall, it was found that, under CBT, there has been a tendency toward:

- fostering closer relationships between industry spokespersons and those in enterprises
- achieving uniformity through CBT, although this process has not been as rapid or as easy as expected
- CBT meeting enterprise needs (however it is unclear whether enterprise satisfaction stems from CBT itself or associated initiatives)

- ❖ improved competitiveness, especially in terms of enterprise needs for multi-skilled workers (however there is little evidence that CBT is responsible for the improvement)
- ❖ higher order outcomes and transfer of knowledge through current curriculum. Evidence of the direct contribution of CBT is quite limited however

Recommendations for practice

From the project findings a number of recommendations are made relating to curriculum, teachers' practice and assessment practice.

Curriculum

Recommendations for revision of curriculum practice can be categorised into three kinds:

i) The *intended curriculum*—The sole use of behavioural objectives unduly limits the realisation of vocational education goals. Therefore, process and value objectives ought to be considered alongside behavioural objectives. Where matters of performance are routine and observable, then behavioural objectives may suffice. However, non-observable phenomena such as procedures and understanding may not be easily measurable in the same way. Complex forms of thinking and acting require the use of process objectives to emphasise the centrality of learning activities in developing the knowledge required for adaptability and transfer. While there is a need to continue determining curriculum intents from external sources such as enterprises and industry, input from teachers and other individuals is likely to be useful in providing appropriate experiences. Teachers need to have a role in developing curriculum as well as in implementing programs in order for deliberations to be informed by professional practice.

ii) The *enacted curriculum*—Modification to curriculum accreditation and registration processes could be useful in pressing for a consideration of teaching process factors, particularly those required for developing adaptability and skilfulness. Accreditation processes could specify the kinds of experiences that students should undertake in order to engage learners in the kinds of thinking and acting which are likely to lead to outcomes associated with performance. For example, problem-solving activities of routine and non-routine kinds, integrated workplace and classroom experiences, guided learning to secure understanding, and higher orders of procedural knowledge and group activities embedded in vocational activities. Moreover, accreditation and registration processes should specify how learners' readiness to engage in self-directed activities can be appraised and monitored, as well as the level of guidance required for those who are not ready for autonomous problem-solving.

iii) The *experienced curriculum*—Accreditation and registration procedures might also benefit learning by focussing on how student engagement in activities and appropriate levels of support can be understood. In addition, a heightened emphasis on making links between classroom and workplace would also be useful.

Teachers' practice

The key recommendations for teachers' practice are about providing the bases for teachers to deliver to students the kinds of opportunities, experiences and guidance that will enable them to develop their adaptability and flexibility:

- ❖ *Broadening teachers' role*—Teachers need to be more than implementers. They need to be engaged as adapters, developers and researchers. Teachers need to have more discretion within the enacted curriculum to allow them to act upon their judgements of the best integration of routine and non-routine experiences and the best combination of independent, group and teacher-led experiences. This deeper

involvement will allow teachers to determine better and respond to individuals' needs, and to guide them in developing their adaptability and skilfulness.

- *Deepening teachers' role*—The value of pedagogic expertise needs to be acknowledged hand-in-hand with vocational knowledge. The development of complex forms of knowledge is not straightforward. The contemporary role of teachers as guide in the construction of learners' knowledge requires them to have different kinds of expertise to that required for didactic instructional strategies. Moreover, teachers need to understand how to effectively use combinations of experiences within different learning environments. Thus a greater emphasis on pedagogic principles and practices is needed.
- *Developing teachers' knowledge*—Developing broader and deeper roles for teachers requires them to give more attention to the professional practice side of teachers' work. This means that professional preparation for vocational educators should be both thorough and comprehensive, and that professional development should emphasise pedagogic as well as vocational aspects of practice.

Assessment practice

Changes to assessment procedures are required in order to develop and maintain reliability and validity:

- *Validity*—For assessment to be valid, consideration also needs to be given to the forms of knowledge to be assessed, the circumstances in which performance actually occurs and the importance of assessing understanding, as well as practice and dispositional attributes. In short, validity needs to be considered in terms of benchmarks upon which judgements about students' abilities to be flexible and adaptable can be made. It is therefore recommended that benchmarks other than behavioural objectives be considered, and that more negotiation about the detail of those benchmarks (e.g. situational factors) should occur.
- *Reliability*—Measures of reliability in the decade of CBT focussed largely on the use of standards and outcome statements. With greater diversity of contexts for learning and applications, precautions for reliability need to consider the standing of judgements about student performance and the standing of certification within vocational education. While there may be differences in the detailing of intents against which assessment will be made, approaches such as moderation across a range of contexts will need to be considered in order to assist reliability. Again, professionally prepared educators are more likely to provide these kinds of outcomes.
- *Incentive*—The project data suggest that the issue of incentive is at the core of individuals' learning. The use of non-graded passes may remove a key incentive for VET learners. The kinds of knowledge required to develop flexibility and adaptability require effort on the part of the learner. Removing graded passes may have removed an incentive for students to engage to their maximum ability in the difficult and demanding act of learning these forms of knowledge. It is therefore recommended that graded assessment be introduced to provide an important incentive for learners.

Conclusion

It is now ten years since a uniform system of CBT was introduced into the Australian vocational education system as a result of government policy. As a consequence, the last decade has seen significant changes in the structure and organisation of the country's vocational education system. Changes include a broadening of the field of providers of vocational education, best characterised as a shift from TAFE to VET. There has also been a shift from national prescriptions founded on industrial awards

to a more enterprise-based focus. However, enduring through the decade has been the key goal for vocational education, through CBT, to develop a flexible and adaptable workforce capable of competing globally. What the findings from this project suggest is that to achieve these goals, measures beyond CBT are warranted.

What this project has concluded is that the range of experiences, activities and support provided mostly by teachers, and comprising existing instructional and curriculum practice, are those most likely to be instrumental in the development of flexibility and adaptability. CBT and the reform movement have overlooked many of these contributions. However, the findings in this project show that they are the kinds of contributions that need to be strengthened and prioritised in future arrangements.

2 Reform, changes and transformation: A commentary on the implementation and evolution of CBT

Stephen Billett and Sharon Hayes

This chapter reviews the significant body of literature on CBT and related initiatives and argues that the role of CBT in managing vocational education provisions has subsumed its primary educational purpose, which was to create uniformity within the VET system and to provide a basis for creating a flexible and adaptable workforce. The role of CBT and its purposes within vocational education has been transformed during the decade of CBT. Supporters and critics often disagree over what they consider to be the purpose of CBT. It is probably fair to say that nothing has divided the vocational education community so much as the implementation of CBT. From division can come healthy debate and progress, yet these qualities seem to be largely absent in the debate which has set institutions within VET against one another and marginalised professional discussion. One casualty of the decade of CBT has been tolerance to critical debate within VET. In this chapter, a discussion of the unfolding implementation of CBT is presented alongside an analysis of the literature. In particular, an analysis of the cognitive psychology literature reveals that the behaviourist premises on which CBT is based is inadequate in producing individuals with problem-solving skills and transferable vocational knowledge. Not well represented in this review are opinion pieces representing the untested views and ideas of practitioners and policy-makers involved in the initial implementation of CBT. Some of these voices, however, *are* captured in the empirical work accompanying this study.

Overview

The decision to implement a uniform program of competency-based training in Australia was founded on a belief that it could assist in making Australian workers more skilful and adaptable, and more able to meet the demands of an increasingly competitive global market. It was claimed that only through having a competent workforce would Australian enterprises become import-competitive and export-oriented. However, it is clear that other goals, such as making educational institutions and educators more accountable, were also on the agenda as key policy goals at this time. Those individuals (and institutions) that were to be responsible for the development and implementation of CBT were to be also subjected to it. As the decade of CBT has advanced and the arena of vocational education has widened, the role of CBT has gone from reforming vocational education to managing the increasingly widening provision of vocational education through a diverse field of providers.

What follows in this chapter is a discussion of two broad issues that assist in understanding the current nature of CBT. Firstly, the institutional frameworks that facilitated CBT's introduction are discussed, and this is followed by a discussion about its educational worth. In addressing the first issue, the initial part discusses the circumstances leading up to the introduction of CBT in Australian VET. This is followed by a discussion that considers the changing institutional context of vocational education, which has seen the movement from a purely public, TAFE-based vocational education system to a more market-oriented VET system encompassing both private and public providers. Components of this discussion include the construction of a training market and how the role of CBT changed from reforming

TAFE to managing VET. In the final part on this issue, current shifts, including the institutional move from an 'industry' to an 'enterprise' focus, are discussed in terms of the role of CBT as a means for organising educational provisions. In the final part of the chapter the educational worth of CBT is examined. The overall aim of this chapter is to study the changes in institutional relationships brought about by the implementation of CBT with respect to the research questions outlined in chapter 1, and to draw tentative conclusions about CBT's educational worth to date.

Institutional frameworks: The competency movement and vocational education

For the purposes of this project it is necessary to consider distinctions between CBT itself and the broader CBT movement which has become associated with the reform of vocational education in the last decade. However, current views of CBT are far from consistent. For example, psychological definitions characterise CBT as 'behaviourist' because it measures behavioural outcomes as a means for understanding individuals' thinking and acting (e.g. Bijou 1990; Mager 1962). Certainly, commentators such as Foyster (1990) and Thomson (1991) refer to CBT as being behavioural. Thomson (1991), for example, defines 'competencies' (as they were being introduced into Australian vocational education) as measures of skills to be performed within standards of and conditions for performance, thereby reiterating what Mager (1962) states as the qualities of behavioural objectives. Yet 'cognitive' theory proposes that observable behaviour cannot account wholly for how individuals think and act because there are many instances in which overt behaviour may not be accurately discernible. From a sociological perspective, CBT is seen as a means of viewing policy as social control (Jackson 1993; Law 1994). Other views hold that external influences such as CBT reflect only one part of the transforming role of teachers (Seddon 1997). Beyond these disciplines, policy analyses have defined the 'competency movement' as a set of interrelated policies and practices aimed to reform vocational education (e.g. Lundberg 1994; Harris et al. 1995). It seems that these policies and practices underpin the broader CBT movement that has evolved and transformed VET during the last decade. Nevertheless, behavioural influences and centralised models of curriculum already had a long tradition in Australian vocational education prior to the recent reforms. Indeed, it is held that CBT-type practices have always characterised and defined vocational education (Moran 1997).

From a review of reports and literature at the time of CBT's introduction (DOLAC 1989; Foyster 1990; Harris, Barnes & Haines 1991; Thomson 1991; Watson 1991, 1993) it seems that its essential specifications were that teaching, assessment, progression and certification ought to be based on competency-based outcomes. Hence, the development of competency standards were used to specify what was to be taught, how students would progress, how and against what they were assessed and offered certification. So the essential elements were competency standards, prescriptive syllabuses, modularised materials, standards against which work is assessed and procedures aligning competency standards with curriculum documents and certification of courses. The National Training Board's definition, which became something of a motif, stated that:

> *A competency comprises the specification of the knowledge and skill and the application of that knowledge and skill … to the standards of performance required in employment.*
>
> (NTB 1992, p.10)

So the accreditation and registration processes are included as part of CBT. In sum, competency-based training is an overall view of instruction and assessment primarily concerned with measurable performance or competencies. To be measurable these

competencies must be stated in terms of criteria for performance, standards and conditions (Mager 1962). So instruction and assessment concerned with demonstrable performance are closely associated with CBT. For example, being able to recite 'times tables' or perform a physical task are demonstrable behaviours. The development of national standards and uniform curriculum documentation and resources can be seen as closely associated with CBT and a goal of uniform national implementation.

The broader competency movement, however, refers to a raft of associated procedures aimed at securing the reform of and responsiveness from the vocational education system. The parameters of this movement are constantly changing, whereas the essentials of CBT itself remain more constant. For instance, at its inception CBT was only to be applied to trade courses (Watson 1991). Later, however, it encompassed all courses in TAFE then later all those in the VET system. The broader goal of responsiveness in terms of meeting the curriculum needs of industry and, more recently, of enterprises, also reflects a change in focus. An enduring issue in the CBT movement is the relationship between self-pacing and CBT, and although these processes remain discrete, the initial intention was probably that over time they would become more closely linked and enacted (Watson 1991).

From a psychological perspective, CBT is clearly founded in the behavioural view that emphasises the identification, observation and measurement of human behaviour. Behaviourists argue that it is not useful to speculate on the hidden processes that occur when individuals think, act and learn (Bijou 1990). They suggest that only observable behaviours offer the most certain basis for knowing and making judgements about human action. Behavioural objectives are used to guide (direct) instruction and also to make judgements about individuals' behaviour. This approach claims to offer an *objective* (i.e. unbiased) approach because performances are observable and, therefore, not open to interpretation in the sense that motives, for example, are (Mager 1962). Measurable qualities are attractive to those interested in securing uniformity and accountability to external standards, such as responsiveness to national industry standards (Jackson 1993; Stevenson 1995). Indeed, even advocates of reform in vocational education have adopted the behavioural approach because it presents demonstrable evidence that the desired learning outcomes have been achieved (NTB 1992). Given the demand for accountability, especially in times of economic or social stress (Stevenson 1995), it is perhaps understandable that vocational education authorities are drawn to an instructional and assessment method that offers the promise of enhanced control over what is taught and assessed. Moreover, in the broadening field of vocational education, such prescriptions are seen as welcome, especially by those individuals who lack adequate professional preparation and who nevertheless find themselves responsible for training others. It has been found, for example, that novice teachers are often comforted by the security of detailed prescriptions for their teaching practice (Brady 1995). So whereas an experienced educator may reject the imposition of such prescriptions as a challenge to their autonomy, novice teachers may be reassured by such prescriptions.

However, the competency movement was no stranger to Australian vocational education in 1989. Hence, to consider the antecedent conditions it is important to acknowledge the place of CBT within vocational education at that time (Blachford 1986; Sandery 1985). So, although this review examines the implementation and contribution of CBT from 1989 to the present, this period is really one of consolidation of what had already occurred. Behavioural approaches and the use of behavioural objectives have been employed within vocational education in this country since the mid-seventies at least (see Blachford 1986; Sandery 1985). Behavioural objectives have long been used to establish benchmarks for criteria-based assessment and for otherwise guiding vocational educational provisions in Australia. Indeed, prior to

1989, there was a competency-based teacher education (CBTE) program being offered by Hobart and colleagues at the (then) South Australian College of Advanced Education.

At that time, State-based curriculum documents made use of behavioural objectives to guide curriculum development, instruction and assessment (e.g. see RATE guidelines). The classification of courses was based on the kinds and frequency of the behavioural objectives used as course intents. In Queensland, the classification of courses (e.g. Certificate or Associate Diploma level) were determined by the frequency with which particular verbs were used within statements of educational intent (objectives) in Bloom's taxonomy (see Gronlund 1981). For example, an Associate Diploma was required to have a certain number of behavioural objectives expressed using verbs such as 'synthesise', 'analyse', etc. whereas lower level awards (e.g. Certificate) were permitted a greater number of 'define' and 'describe' verbs to demonstrate lower level behaviours[2].

In Victoria, the modularisation of standard State-based syllabuses and associated learning guides had a long competency-based tradition in the trade areas (Mealyea 1985). Indeed, much of what had been common practice in Victoria (e.g. CBT formats, modularised curriculum components such as the Instructional Systems Model, CBT-based resource materials) was held as a model for other States and the Territories to follow (Blachford 1986; Mealyea 1985; Sandery 1985). It was no surprise that the first national CBT centre was established in Victoria. It was proposed that this Centre would advise others and disseminate information about the implementation of CBT, and it was almost obligatory for representatives of other States and Territories to visit Richmond College to observe this model of a CBT operation. Richmond featured a 'skills supermarket' with flexible entry and modularised courses that permitted its clients to come in and select modules and then progress through a self-paced program of study. So the antecedent conditions were not uniform in the two States, with Victoria enjoying a greater familiarity with many of the initiatives that were to be implemented nationally. However, from the Victorian experience came concerns about the transition from CBT to self-pacing. Many States, Queensland included, balked at the prospect of transferring to a self-paced approach to vocational education delivery and were concerned about the costs of changes to the infrastructure to accommodate self-pacing.

The behavioural tradition within vocational education was associated with, and in part attributable to, the low standing of VET. Vocational practice has been, and still is, commonly perceived as made up of routine and predictable tasks. This perception is found even within the educational community. Stenhouse (1975), while rejecting the appropriateness of behavioural objectives for compulsory education, suggested they had great utility for describing and judging vocational tasks. More recently, this view has been used to contest the introduction of CBT into the Australian higher education sector. Unfortunately, these views underestimate the complexity of vocational knowledge. It is often assumed that professionals engage in more complex thinking than those working in vocational tasks, either at the trade or non-trade levels. Government-sponsored frameworks differentiating between the nature of knowledge required for diverse forms of work have reinforced this common assumption.

The Australian Skills Framework (ASF) (National Training Board (NTB) 1992) suggests a different ordering of complexity at different levels of vocational classification. Different levels of routineness and complexity of tasks are offered in this framework. Yet a uniform CBT approach is prescribed to secure and assess the knowledge within at least six of its eight levels. (The other two are the domain of higher education.) However, while stating different levels of complexity of work activities in this framework, the only educational consideration is duration of course, not a differentiated focus on instruction, educational intent, and assessment to secure and appraise the knowledge required for those activities. Evidence suggests that all

categories of workers (including professional) engage in similar patterns of routine and non-routine activities regardless of the level at which they are classified (Billett 1993b). That is not to say that different categories of workers do not have specific domains of knowledge which they need to develop or that those domains may not be of differing orders of complexity. It is incorrect, however, to assume that 'unskilled', non-trade, trade, paraprofessionals and professionals engage in qualitatively different kinds of thinking and acting when conducting their work. All categories of workers engage in activities that require combinations of routine skills, higher orders of procedures and deep conceptual knowledge (see Stevenson & McKavanagh 1992).

It is not wholly accurate to describe certain levels of workers as engaging in routine thinking and acting. Regardless of what level workers are categorised at, they require higher orders of procedural knowledge to complete everyday tasks in the workplace. The issue here is that CBT is unlikely to be able to develop or assess this capacity because it is concerned primarily with demonstrable behaviours, rather than with the procedures that underpin those behaviours. The evidence suggests that behavioural approaches alone are inadequate for describing and organising curricula to develop the forms of knowledge that permit individuals to undertake everyday work activities. In accepting the behavioural approach, 30 years of cognitive psychological research into understanding complex thinking and acting and the nature of expertise appears to have been ignored. Importantly, criticisms of this kind are not coming only from researchers. Many employers have reported difficulty in categorising workers into just one ASF level, because their activities often span several levels. In part, this concern led to a consolidated request by the ACI and ACTU to move away from this framework (ANTA 1993). This request appears not to have been accepted.

So the rationale for the introduction of CBT appears to be premised on misunderstandings about the demands of vocational practice and the complexity of vocational knowledge. So, the characterisation of vocational practice as routine and predictable, when compared with professional practice, persists today. However, as developments in our understanding about expertise have increased and as clearer understandings about workplace requirements are identified, it becomes clear that if skilfulness and adaptability are to be realised, vocational education has to prepare workers who are 'able to generate and evaluate skilled performance as technical tasks become complex and as situations and processes change; reason and solve technical problems; be strategic, innovative and adapt' (Stevenson 1994, p.9). A wealth of empirical work in cognitive science, some of it undertaken in this country (e.g. Evans & Butler 1992; Stevenson 1986) is available to support this contention.

The point is that competency-based and behavioural approaches to education have had a long tradition in Australian vocational education. They were not novel or innovative when implemented nationally with a greater and concerted government effort toward uniformity from 1989 onwards. What changed was the expanded use of this approach. The changes included:

- having national rather than State-based formulae for curriculum, instruction and assessment
- adhering to national industry standards as a basis for curriculum development and practice
- removing graded passes
- tightening compliance arrangements through accreditation and institutional frameworks
- using behavioural benchmarks for associated assessment tasks (e.g. credit, recognition of prior learning)
- modularising curriculum components under national CBT frameworks

These moves were undertaken in pursuit of national uniformity and associated policy goals, rather than offering CBT as an innovative educational practice. Hence, commentators have viewed these changes as being driven by a concern for control over and management of vocational education, rather than concern for the quality of educational outcomes (Jackson 1993; Stevenson 1995). Policy interventions of this kind, when initiated by government are aimed at reshaping the frameworks of institutions (Stretton & Orchard 1994). As institutional frameworks (norms and values) are transformed, so are the practices within them.

Changes to institutional frameworks are likely to have profound implications for practice. Institutions are viewed as sets of norms which model the behaviour of those who act within them (Cammack 1992; Law 1994; Research School of Social Science 1995). These social practices are not about socialisation, but established bases for behaviour. Individual choices occur within the context of social practice and include both 'conscious and unconscious choices' (Lawn 1996). In the case of instructors within VET, the key emphasis is on orchestrating, managing, and judging teaching and learning (and the associated organisational and cultural infrastructure) to sustain their teaching practice (Connell 1996). So concerns about institutional practice are central to an appraisal of the influence of CBT on Australian VET. The degree to which institutional frameworks and educational practice have been transformed is central to this investigation. For instance, Baverstock (1996) proposes that, for the teachers she investigated, the implementation of CBT brought with it frustration, the feeling of disempowerment, and concerns that attempts to measure student performance were subordinating teaching and learning. Despite this, she questioned whether much had changed in the actual practice of teachers. This view was endorsed by much of the data gathered for this project. The following sections discuss the transformations in the institutional contexts of VET brought about by CBT.

Developing the industry institutional context

The strengthening of CBT over the last decade followed a particular course. Firstly, the government established national industry standards (e.g. NTB 1991, 1992) reflecting the requirements of national industrial awards (Lundberg 1994). This was extended to the formation of national industry committees to organise and authorise national curriculum documents. The term *industry* here refers to the spokespersons for the sector of industry that comprises the public and private enterprises. These spokespersons reflected the interests of both employers (peak employer groups) and employees (unions) within each industry sector. As well as their representation on peak policy and regulatory bodies such as the National Board of Employment Education and Training (NBEET) and NTB, they were to comprise the membership of ITABs which function at both the State and national level. So, within each industry sector, the overall framework and procedures for enacting vocational education were constituted at both the State/Territory and national levels. Hence, the process is often described as being 'industry-led'. In fact, they were industrial relations led.

It has often been argued that vocational education under CBT has been subordinated to industrial interests and conflicts. For example, in the late 1980s and early 1990s a range of entry level training programs did not progress because no industrial representation existed. However, the frameworks within which advice and decisions were made were themselves constrained by government policy. For example, spokespersons were not permitted to decide whether CBT, national standards, recognition of prior learning (RPL) or the like were suitable for their sector. Rather than being industry-led, spokespersons for industry were co-opted by the government and colluded in the implementation of government policy, albeit with strong bi-partite support.

Individuals with educational expertise seemed to have been displaced from the decision-making processes during this period. This change was most likely justified in seeking more demand-side responsiveness from the VET system. Hence, educational input was to be focussed on realising what industry demanded. In keeping with this view, teachers were to become characterised as being 'implementers' of the content and outcomes that others had decided upon.

The position of the unions, as representatives of labour, is particularly curious given their opposition to Taylorist prescriptions earlier in the century. These prescriptions are the workplace organisational analogue of CBT (Billett 1995). Even more curious is that, in support of the corporatist approach to curriculum development and implementation approach, unions colluded in attempts to remove the discretion of fellow unionists (e.g. teachers) (see section on industry versus enterprise for more discussion) (Billett 1995). So it seems that government policy, which was focussed on micro-economic reforms, drove the so-called 'industry-led' process via corporatist bi-partite interests. Institutional concerns associated with control were privileged over the quality of educational practice (Jackson 1993). So, within the tri-partite processes of decision-making, existing knowledge about educational practice required to achieve governmental goals was ignored. Educators were perceived to have failed to deliver appropriate vocational education provisions. Industry leadership was required to secure a responsive vocational education system that could deliver to industry a flexible and adaptable workforce. Equally, it seems the policy advisory processes ignored decades of research into how best to develop skilled workers.

To balance the argument, government was seeking to secure policy responses to eroding economic circumstances and chose to enlist those interests which it believed would best help redress these circumstances (Moran 1997). Baverstock (1996) suggests that government was responding to negative international appraisals of its performance in the field of education and training. These appraisals were aligned to changes in views about economic orientations which emphasised the market and private good as a precursor or superordinate to the common good and which were adopted by a federal Labor government. Unions were also seeking to advance the interests of their membership and others by advancing wider participation in VET. Indeed, one of the key outcomes of the training reform that followed was a concern to broaden the provisions of VET to groups who previously would not have had access to training provisions. The widening of the field had the corresponding effect of broadening the field of providers and provisions as much of the TAFE infrastructure was bound to historically based arrangements such as trade courses. Consequently, to make VET provisions available to a broader group of workers, workplace learning arrangements, industry-supported Skill Centres and specialist provisions emerged. This was especially evident in Queensland, where the needs of workers in industries such as coal mining, secondary processing, chemical production, plastics and metal coating needed to be met.

To consider the transformations in the institutional context it is useful to map aspects of the changing social, political and economic context within which an evaluation of the contribution of CBT might best proceed. Therefore, in the next section, analyses of the changing institutional context are presented under the two headings: From TAFE to VET, and From Industry to Enterprises.

The changing institutional context

From TAFE to VET

Significant changes in the institutional context have occurred within vocational education and training since 1989 and the commencement of the move to implement

CBT uniformly. These changes have resulted in transformations to its institutions, purposes and subjects, and can be conceptualised as moving from TAFE to VET. In 1989 vocational education in Australia comprised mainly that which was being offered through the nation's TAFE colleges. Now, in 1998, the provision of vocational education has been extended to include high schools, workplace-based arrangements, private providers, community providers, programs in agencies concerned with the labour market (e.g. Skillshare) and group apprenticeship schemes. Together, these diverse provisions now comprise the nation's VET system, of which TAFE is the most significant component.

Currently, most States are in the process of separating the providers (including TAFE) from government as the principal purchaser. Open tendering for VET courses is seen as broadening the range of VET providers with States such as Queensland and Victoria having hundreds more registered private providers of VET than a decade ago (Anderson 1997). The field of VET providers is now much broader. Whereas in the early 1990s, an investigation of the contribution of CBT to VET might have been restricted to its influence within TAFE colleges, it must now account for the broader VET field. The broadening of the VET field, it needs to be added, has been a deliberate policy goal to offer the provision of vocational education outside of TAFE colleges. Concerns about shifting the cost of industry training from the public to the private purse (e.g. Deveson 1990) were influential in seeing moves to have accredited programs made available in workplaces and to encourage private provisions into an 'open training market' (Anderson 1997).

Early in this period of change it was seen as important to offer accredited courses in settings outside of TAFE to improve and broaden access. It followed that the accreditation agencies in each State and Territory were separated from the TAFE system to aid their impartiality and to facilitate the broadening of VET provisions. At this time TAFE colleges were required to address the same accreditation requirements as private and industry-based providers in demonstrating their ability to offer courses. TAFE colleges were to be just another 'provider'. Any registered provider could offer courses in the training market but they and the courses they wished to offer would have to be accredited. The accreditation processes included mandatory adherence to industry prescriptions, CBT methodology and associated practices such as modularisation and RPL. While opening up the training market, however, mechanisms were enacted to mandate the preferred mode of instruction and assessment. For example, adherence to CBT became a uniform requirement for the accreditation of courses and their provision. From the focus on CBT as a means of reforming TAFE in 1989, it became a management tool for the burgeoning field of VET.

Therefore, significant changes to institutional practices were guided by CBT. The modularisation of curriculum components (e.g. text-based modules and learning guides) was offered as a means for making the provision of vocational education more flexible. This was to permit greater flexibility in modes of provision such as self-pacing, supported by text-based resources, so that students could work more autonomously. This had consequences for teachers' practice, including developing these materials and maintaining their currency, and simultaneously dealing with students at a range of points of progress. For students, this approach often meant learning to work in a more autonomous manner and developing a capability to use these resources effectively. Students' ability to read or to manage the requirements of text-based instructional media became important to their success in VET courses. Mealyea (1985) has indicated that such provisions significantly disadvantaged those students with weak reading and comprehension skills. The findings of more recent work implicitly support these concerns (Crump et al. 1997). So there were changes in the institutional practices of both students and teachers emerging from modularisation of CBT-based material.

Marketisation

More recently, the training market has been intensified with the introduction of tendering (Anderson 1997; Moran 1997), which has been used to distribute vocational education funds on an open market basis. This has extended further the non-TAFE provision. Each year, in some States, funds that were previously reserved for the public provision of vocational education programs through TAFE are increasingly being made available through tender. Although TAFE institutions currently capture the majority of these funds they must compete with each other and other providers through competitive tendering. Increasingly, community and commercial providers now operate in competition with TAFE institutes. Moreover, there is discussion about contracting out the accreditation process to private providers. This move indicates a reduced concern with national uniform standards and outcomes associated with other factors (such as market-based concerns). The issue here is that since the implementation of CBT in 1990, there has been a shift from TAFE as the virtual sole provider to a widening field of providers. This shift is towards the development of a vocational education and training system in which goals, focus and procedures have become inconsistent, even while emphasising uniformity as a key goal. For instance, the purpose and goals of the current provisions are not always consistent with the term 'vocational education'.

Vocational education is necessarily concerned with developing the kinds of occupational or vocational knowledge that permits individuals to practice their vocations across circumstances of their employment. However, the manifestations of this goal are unlikely to be uniform. Consider, for instance, the differences in outcomes of an enterprise-based VET program, one offered to school students, or one offered for the long-term unemployed. Understandably, when enterprises are funding their own employee training they emphasise the specific needs of their enterprises (Billett 1993a; Billett & Hayes 1998; Catts 1996). Consequently, training might be enterprise or even equipment specific[3]. Although a specific and short-term work-based training program may have broader unintended outcomes, these might be quite different from those that result from a course that develops individual attributes, which are transferable within and across occupational activities. Representatives from 'industry' have expressed concerns about narrow enterprise-based goals (Billett & Hayes 1998).

Equally, the provision of vocational programs in schools might be about an introduction to the world of work, rather than developing specific vocational skills. Programs targeted at assisting the unemployed may have an employment start, rather than a specific vocational outcome as their goal. Hence, as the field has broadened there has been less clarity about unified and 'industry'-related goals and purposes for this sector. Even the subjects of this sector have changed: it is perhaps imprecise to refer to employees who are engaged in a work-based program or in one that seeks to develop the self-esteem of the recently retrenched, as 'students'.

Consequently, changes in provisions of vocational education have transformed key relationships between individuals engaged in programs and those who assist their learning and make judgements about their progress. Individuals' goals are unlikely to be uniform. They may be about being able to increase remuneration, learning to use specific pieces of equipment, or an employment start, as much as preparation for a vocation. Take, for example, the aspirations of five prospective students for clerical courses who were asked what they wanted from the course.

1 *A good job, which is not in a factory and pays well so he can buy a house.*

2 *Partner wants to retire from train driving in five years time and drive trucks. She wants to be the bookkeeper for this business.*

3 *Has been in catering for the last ten years but was made redundant last year. She enjoyed some short computer courses and decided to work her way up the ladder.*

4 *Daughter is in now in high school and will need to know how to use computer. It is important that she can show her because daughter has a learning disability.*

5 *Completed a course last year, Cert. in General Ed. for adults, and decided she wanted to do another course. She is new to the region and hopes to meet people and get some work in office admin, even as a volunteer. She has not been in the workforce for 20 years and wants to bring herself up to current standards and get over her fear of computers.*

(Billett & Hayes 1998)

Also, the different types of experiences offered by schools, workplaces, colleges, community settings, and different target audiences for vocational education, emphasise the diversity of the enacted curriculum in the VET sector and its changing institutional context. Hence, the changing context has seen major shifts in the focus of vocational education provisions.

From reform of TAFE to management of VET

It is important to identify the origins of the broadening of VET provisions as this illustrates the changing institutional context. It has been proposed by a number of commentators that CBT was introduced as a tool to organise and reform the activities of teachers in TAFE (Jackson 1993). It was suggested in governmental documents that teachers and TAFE institutions had failed to serve industry with the appropriate level of skilfulness required to be internationally competitive (e.g. Dawkins 1988). Policies that sought to make Australia more globally competitive placed vocational education at the centre of its strategies. Given its importance, vocational education was held to be too important to be left to teachers (Dawkins 1988). Therefore, industry advice became influential in educational decision-making, and the discretion previously afforded teachers was reduced.

Vocational teachers were to be implementers of programs that were designed by others and based on national industry standards (Billett 1995; Killen 1990). Some recent studies (e.g. Baverstock 1996; Cornford 1996; Killen 1990; Robinson 1993; Roux-Salembien et al. 1996; Rushbrook 1997; Ryan 1997; Simon 1996; Smith 1997; Smith & Nagle, 1995; Williams et al. 1997) demonstrate how this 'top-down' approach to the implementation of vocational education curriculum has resulted in the dissatisfaction of the very individuals who were supposed to implement this approach with uniformity—teachers. Baverstock (1996) for instance, concluded that teachers were experiencing frustration, a loss of control, a lack of clarity about standards, confusion about the focus and frequency of assessment, and beliefs that students' learning was subordinate to students' assessment. Significantly, TAFE teachers have reached the stage where any initiatives are now seen as threats to, or unwelcome reform of, their work—for example, their resistance to flexible delivery because of its association with government directives (Smith et al. 1996).

Adherence to national formulae demanded an approach to instruction and assessment that offered the prospect of uniformity of implementation—it had to be 'teacher proof'[4]. Competency-based training and assessment was seen to provide such an approach. So there was an expectation that the implementation of CBT would lead to provisions of vocational education and training that were uniform and consistent with national industry mandates (e.g. national standards—national curriculum). Underpinning this was the use of national industrial awards as the basis for other government initiated micro-economic reforms to work practice.

However, with the widening of vocational education provisions, the scope of the managerial task became more complex. With VET provisions extending into schools, workplaces, communities and private providers, CBT became the means by which national industry blueprints were managed through a nationally consistent approach to the accreditation of courses: the National Framework for the Recognition of Training (NFROT). The adherence of teachers and the broadening provision of vocational education to industry formulae transformed the role given to CBT by government. So, the transformation was from reform of teachers' practice and TAFE provisions to management of a national VET system. At the same time, greater differentiation in the goals and purposes of VET programs suggest that rigid uniformity premised on national industry prescription may not suit this emerging diversity. These national prescriptions may partially explain the recent decline in interest in apprenticeships by enterprises (Billett et al. 1997; State Training Board 1995).

Certainly, it seems smaller businesses are failing to see the relevance of national industry-based curricula (Baker & Wooden 1995; Catts 1996; Coopers & Lybrand 1994) and are concerned about its excessive bureaucracy (Schofield & Associates 1996) and compliance costs (Cabalu et al. 1996). Lundberg (1994) claims that the Deveson Report (1990) signalled a change in government policy focus away from direct support for industrial relations reform (Award Restructuring) to the reorganisation of the vocational education system, which included opening and managing the training market. Hence, there are complications and contradictions in attempts to realise government policy associated with vocational education uniformity on the one hand, and flexibility in provisions on the other. Interestingly, it seems that co-opting the market to secure goals inevitably leads to government losing control (Ball 1990). Therefore, it seems that one of the key mechanisms employed by government to manage and reform VET provisions may well be weakened by market-based reforms. Certainly, the uniformity of industry-determined outcomes, by which TAFE was valued in the earlier phases of the training reform, has been dissipated by the recent focus on enterprises.

Some of the implications for the three sub-projects arising from this discussion are as follows.

- *For curriculum development* the goal of a CBT system was instituted initially with uniformity and adherence to national prescription in mind. Much of this goal was associated with highly detailed behavioural objectives (Athanasou, Pithers & Cornford, 1993). Most teachers were not involved in decisions about the use of the CBT approach (Cornford 1996). They were asked to merely implement what had already been decided. The question here is whether (a) such an approach is desirable and (b) CBT was capable of delivering uniformity and adherence as intended by its sponsors. The second point questions whether such prescriptions are the most useful means of promoting national consistency while at the same time permitting flexibility in addressing diverse and emerging needs. The conflict here is between uniformity and diversity, two contrasting goals. These concerns address both institutional practice and the educational worth of CBT. More recently, CBT's role has changed to become the basis for uniformity within a broad field and an emerging curriculum model that seeks to tailor national prescriptions more to local needs (e.g. Training Packages). Simultaneously, localised and enterprise-based requirements are eroding the need for national uniformity, perhaps to the degree that any notion of uniformity, regardless of its desirability, is being threatened. Consequently, it is necessary to examine both the degree to which uniformity can be realised and what this means for curriculum practice.
- *For assessment practice* the concern is whether assessment could be valid and reliable under the circumstances outlined above. Teachers remain uncertain about what is expected because of a lack of guidelines and guidance (Baverstock 1996). The

broadening range of purposes and goals of vocational education programs (e.g. for long term unemployed, returnees, new starters, advanced learners) suggest that the bases for making judgements in programs are likely to be different even though they are supposed to be uniform. Reliability may be jeopardised given the range of contexts in which assessments are to be conducted within VET. The prospect of tried methods of securing reliability (e.g. moderation) becomes more difficult when assessment takes place in quite different contexts, within which individuals may be differentially prepared. It seems curious that given the concern with uniformity and reliability, policy has had so little focus on orchestrating moderation processes, relying instead upon supposedly objective assessment benchmarks aimed at directing assessment practice (Rumsey 1997). However, we may ask how valid is assessment of flexibility and adaptability, when based on behavioural objectives? Other concerns also persist. For example, standards of excellence are unlikely to be fostered if competence is accepted at the minimal level (Cornford 1993; Ryan 1997).

- *For instructors* the shift to a broader VET system involves the broadening of roles for those who are expected to implement with uniformity. It raises the question of whether being mere implementers of programs developed centrally, is desirable or even possible if the needs of students and situations in these widening options for practice are also to be addressed. It is unlikely that these needs have been, or are going to be, accounted for in uniform national prescription. Is it possible for educators to be mere implementers of curriculum or are they always going to be modifiers and developers, to use Marland's (1978) terms? For example, to what degree are the needs of individual enterprises or schools, let alone individuals, likely to be uniform? As the field of vocational education has broadened from TAFE to VET, the roles of teachers have become less clearly defined and the ability to be mere implementers may become redundant. Overwhelmingly, surveys of teacher satisfaction with CBT report a lack of involvement, obscure goals, and concerns about the pedagogy which CBT champions (Lilley 1997). Significantly, doubts about CBT have extended to other initiatives such as flexible delivery (Smith et al. 1996). This then raises the important issue of whether what instructors are doing is consistent with what CBT sponsors expect. Some studies (e.g. Simons 1996; Smith & Nagle 1995) suggest that teachers are confused and uncertain about what CBT is, and that their practice is unlikely to have changed significantly. Smith (1997) suggests that what is taken as a pure CBT approach has not been adopted widely (Van Berkel 1997).

In the next section, decentring in the institutional context is discussed as the focus is shifting from industry to enterprises.

Centralised to de-centralised: From industry to enterprise

Another key transformation that has taken place in the last decade is the elevation and subsequent erosion of the standing of 'industry' leadership (Billett & Hayes 1998). There are now moves toward a more deregulated and enterprise-focussed curriculum such as those found in the Training Packages. This approach may grant greater discretion and autonomy to the practitioner. Born out of (the then) Department of Employment, Education and Training (DEET) industry classification, provision of vocational education was, from 1989 onwards, organised on the basis of industry sectors. These sectors were organised under industry classifications and managed by national and State-based ITABs. The archetype used was the metals industry. This industry offered a hierarchical career structure of apprentice, tradesperson, advanced tradesperson, and paraprofessional engineers. Indeed, the metals industry was foremost in its demands for reform of the vocational education system. It was part of the bi-partite mission to Europe in 1988 that provided the basis for the reforms that began in the following year (Harris et al. 1995). It was also central to the award

restructuring process that linked national industrial agreements, such as the National Metals Award, to VET provisions (NSW TAFE 1990).

Unlike the United Kingdom, which used occupations as the basis for delineating the provision of vocational education, Australia settled on industry categorisations (NTB 1991, 1992). It seems that the close linkage with national industrial awards—another key area of reform—and the model of the Metals Industry Award influenced this choice. Throughout the early part of the 'decade of CBT', agencies such as the NTB, the Australian Committee of Training Curriculum, and the Standards and Curriculum Council of ANTA were established to elicit consent to—and to advance—national industry uniformity. Also, procedures for the development of national standards were managed by industry-based, peak national organisations known as Competency Standards Bodies (National Training Board 1992). The metals industry model was used extensively by the National Training Board in frameworks such as the Australian Skills Framework. Interestingly, the metals industry never managed to negotiate a set of national standards for itself, due to resistance by particular industrial interests who were concerned that their interests would be subordinated. So, although this industry archetype offered a clear career path, its cross industry occupational basis caused problems in developing national standards.

As part of the move for a national VET system, ANTA was established in 1993. This organisation is quite atypical in the Australian public sector, having a managing board comprised of federal and State ministers, thereby aiming to transcend the usual State-federal divide. It has established itself as co-ordinating, and, some would argue, controlling, the national organisation of VET. Its adherence to CBT methodology has been unswerving. In recent debates about amalgamations between higher education and TAFE institutes, Moran (1997) has stated that what sets these education sectors apart is CBT. Moreover, transformations of curriculum development, such as the Training Packages, remain firmly entrenched in a CBT format. Given the apparent disregard for understanding of learning theory, it seems curious that a single orientation to instruction and assessment features so strongly and is used to distinguish differences between higher and vocational education. Hence, commentators conclude that this choice is premised on lingering concerns with accountability of practitioners (e.g. Jackson 1993). However, in this instance it may well be using CBT as a tool to keep higher education at arm's length. First, CBT was offered as a fundamental plank of the training reform agenda and now it is being proposed as a means to distinguish between educational sectors.

So the initial institutional context associated with CBT was focussed on the needs of industry. The rise of the 'industry' model saw the development of a range of national standards, national core curricula, and policies and practices that had uniform applicability across the nation. Such a centralised system was primarily influenced by the voice of industry spokespersons. Although modelled on the tripartite model of engaging capital, labour and the state, the centralised and corporatist approach to VET became quite exclusive. There were few avenues for other voices to be heard in this model. It seems that the voices of teachers, researchers, commentators and even enterprises were not welcome, particularly when they questioned the corporatist view.

Yet in their determination to implement policy goals, it often seems that the industry spokespersons for enterprises were more aligned to the requirements of government policy than those of the enterprises they represented. The placement and funding of ITABs under government auspices leaves open the prospect of closer alliances with governmental concerns than those of the industry they serve. For instance, take the policy on non-graded passes within CBT. It seems that enterprises often want to know more than whether their apprentices/trainees or potential employees are competent. Employers want to know how their employees or prospective employees compare

with other students. Yet those who speak on their behalf seem to have ignored this request for quite some time. Only in recent times, perhaps with the easing of centralised control, has some softening of this position occurred[5] (Rumsey 1997).

Teachers have struggled with the same problem. They wish to acknowledge and reward performance (Cornford 1996; Roux-Salembien et al. 1997; Smith et al. 1997; Williams et al. 1995). Students also seek to have their performance recognised in ways other than a non-graded pass. It has taken repeated complaints by enterprises that the national modules have failed to address their needs, for the more flexible training package approach to be adopted. Doubtless, the emerging decline in sponsorship by enterprises of entry-level training (STB 1995), the lack of reference to training arrangements in enterprise-based award agreements (Guthrie & Barnett 1996; Misko 1996), and the preference for shorter entry-level training options (Billett et al. 1997) has finally prompted this action. It seems that there is a tension in the role of representatives of industry. This is because they are funded by government to be the spokespersons for, and deliverers of government policy, rather than as advocates for the enterprises that they are presumed to represent.

The institutional context is still changing, as are institutional practices. Recently—perhaps for the reasons mentioned above—the enthusiasm for a national industry focus has declined. Four key factors underpin this change in the institutional context. Firstly, with the change of federal government and the change in industrial relations policy has come a period of tension between organised labour and government. Hence, bi-partite employment arrangements are under strain. Secondly, there has been a significant shift from a reliance on national industrial awards to enterprise-based arrangements (Misko 1996). The use of national prescriptions has been undermined in the contemporary context of work organisation and, as a consequence, has in turn undermined structured VET provisions. For example, references to structured VET provisions are largely absent in most enterprise agreements (Callus 1994; Guthrie & Barnett 1996; Misko 1996).

It is clear that a system modelled on the metals industry approach was inconsistent with the needs of other industry sectors whose workforces were not organised hierarchically, and whose movement was likely to be sideways, transcending industry sectors (e.g. as in clerical work). With the move away from uniform national industry mandation, the need for a teaching and assessment approach premised on uniformity and adherence to national prescriptions has become redundant. This is significant for CBT, as its main rationale is its support of national industry standards and uniformity in VET practice. Thirdly, with the use of market interventions within VET, the perceived ability to control is lost (Ball 1990). There are clear tensions between an approach that demands fidelity to centralist prescription and one that emphasises providers' ability to address the needs of clients (Billett & Hayes 1998). Fourthly, the centralist approach seems to have failed to secure the very goals that were set out in the national training reform agenda—that is, to increase the provision and quality of VET and to secure greater sponsorship (Billett et al. 1997). It is clear that there has been a collapse in the provision of entry-level training and a preference for short-term traineeship-type arrangements than the longer duration apprenticeships (State Training Board 1995, 1997).

At this time, it seems that the corporatist and centralist approach to VET is in decline. The training packages approach sponsored by ANTA seems to reflect the concerns about decentralisation. Latitude in negotiating the content of training is now permissible, although CBT is still a requirement of curriculum arrangements. Overall, however, some of the shifts in the institutional context seem to be undermining the rationale upon which CBT is premised. There is even a drift back to realignments

between the VET systems and schools under State government departments, which is indicative of changing priorities and movement away from central prescription (e.g. Victoria, South Australia and New South Wales). The ANTA/States agreement has also been re-negotiated, weakening the role of the centre, and further erosion is desired by some State systems. In all, its seems there is a decentralisation taking place, which is currently most evident in the shift from an 'industry' to enterprise focus. With this shift to an enterprise focussed system comes the inherent danger of ad hoc and piecemeal approaches that are evident in the UK (Billett 1997b). There, evaluations of the recent attempts to reform entry-level training have revealed that such reforms encourage division in arrangements for learning, certification and remuneration (Ernst & Young 1994, 1995). These outcomes have led to, amongst other things, the further disadvantaging of the very target group for which the initiative was intended (Billett 1997b). Equally, distinguished educators publicly expressed concerns about reliability of assessment arising from these initiatives. The British experience suggests, therefore, that the adoption of these measures may not be in the long term interests of individuals, enterprises or industry. These dangers are particularly likely to be the case when this shift is associated with a deregulated market-based approach.

Recently, it has been suggested that a correction in the enterprise-focussed VET provision is needed to include the legitimate concerns and needs of individuals and the regions in which they live, as well as those of enterprises and industry (Billett 1997 et al). The prospect for the future is a broader role for the vocational educator in designing, developing and evaluating curriculum provisions which address more situational needs, and a support role by vocational educators working with local TAFE institutes. It is proposed that vocational educators' practice will be extended into determining and developing curricula to address localised needs, a role that takes them beyond being mere implementers. However, it remains to be determined whether the constraints applied during the 'decade of CBT' have inhibited the development of the skills required to address these changing demands.

This transformation in the institutional context has provided changes for institutional practice and foreshadows more change in the future. These changes in practice are discussed next.

Curriculum practice—shaped initially by detailed national industry prescription. Currently, a move to address local and regional factors is emerging. Such factors are of a different kind than those best handled by industry prescription. Situational factors, such as determining students' needs and aspirations, are not easily stated as behavioural outcomes. The tighter the defined objectives the greater the need for them to be negotiated at the local level if they are to be relevant to the needs of that situation. The move to address this situation will need to be accompanied by curriculum practices that seek to address flexibility and adaptability. As is discussed below, this is a shared goal across vocational education, and one that finds support from individuals, industry, enterprises, researchers, teachers and government.

Assessment—based on adherence to industry prescription in which behavioural objectives meant to address vocational practice are used to assess students. A move to a highly deregulated enterprise focussed system may make reliability highly problematic. Although a non-graded assessment (pass/fail) has been demanded by industry, there is the problem of acknowledging excellence, which is reported as being of concern to both employers and students (Rumsey 1997). The motivation of students, particularly those seeking to gain access to higher education, is also impaired. Rumsey's (1997, p.23) report states that both Queensland and Victoria are considering the implementation of criterion-based grading. Moreover, his survey shows that, of all the nation's States and Territories, only Tasmania was not considering some form of

grading. This is due to the difficulty in distinguishing levels of performance when based on behavioural objectives. How can reliability and validity be secured in a system that might have enterprise or situational factors to consider? Indeed, validity and reliability are likely to be transformed by situational factors. There is also the important question of what the kinds of knowledge are being assessed through a CBT approach and what kinds are not (Biggs 1994). In what ways are the forms of knowledge required for flexibility and adaptability (e.g. Stevenson & McKavanagh 1992) reflected in assessment practice?

Instructors—may be disempowered and deprofessionalised by national industry-based prescriptions. Most educators were excluded from the decision-making processes surrounding the introduction of the CBT approach (Cornford 1996). The 'mere implementers' role is not adequate for addressing curriculum and instruction, whether concerned with uniform implementation or not. Current demands for flexible delivery and the tailoring of courses through Training Packages suggest quite a different role for teachers. However, it seems that the potential of the instruction cannot be fully realised if constrained by the competency methodology. Perhaps the dependency on prescriptive curriculum practices may have constrained the capacities of vocational educators to discharge this more comprehensive role.

Having considered some of the factors in the changing institutional context and their impact upon the three areas of institutional practice, it is necessary to consider a second level of analysis—that of the prospects for securing skilfulness and adaptability through CBT—its educational worth.

Skilfulness and adaptability: A shared goal

Common to policies of State and federal governments, and shared by many commentators, is the view that the skilfulness and adaptability of the nation's workforce contributes to its economic growth and development. Hence, the overall goal for vocational education in seeking to develop skilfulness and adaptability is shared by most parties. This goal has national, industry-wide, enterprise-specific and individual implications. If individuals possess the forms of knowledge which permit them to be skilful and adaptable, they have a greater prospect of pursuing their personal career goals and can contribute to securing government's national economic goals. They may also be well placed to work across an industry if their knowledge is robust enough to transfer across enterprises with similar occupational activities or, for another instance, to self-employment. For enterprises, the skilfulness of its employees offers the prospect of them being able to successfully tackle non-routine as well as routine workplace tasks, which includes successfully confronting innovations and developments (Rowden 1995, 1997). For industry, the ability to transfer across and within enterprises in the industry sector is important, as is maintaining and developing the skilfulness of industries' workforces. However, despite this common goal, the implementation of CBT as a means for securing skilfulness has resulted in divisiveness between stakeholders within vocational education. For many commentators and practitioners, CBT alone is incapable of realising the desired skilfulness and adaptability sought by its sponsors.

Founded in the behavioural tradition of identifying observable and measurable behaviours, CBT aims to be useful for workplace tasks that are specific and observable (Bijou 1990; Hogben 1970; Sandery 1985). However, three decades of research in cognitive psychology have concluded that, as a model of instruction or assessment, CBT is *not* well placed for anything beyond the routine, predictable and superficial (Hogben 1970). Take for example, safe working practice. This is a basic, but essential, requirement for vocational practice. Yet it is very difficult to write a behavioural

objective which can address this most basic requirement for safe and effective work practice. Part of the difficulty lies in being able to identify the range of conditions for practice. Even if a highly specific objective was written for a particular task—say, the use of a cutting machine—it would not be possible to know whether operators could transfer their knowledge safely to another kind of machine. The concern here is whether the student assessment takes into account the procedures they use in identifying another cutting machine and consider how to use it safely.

Then, there is the issue of 'dispositions', which are one's values, attitudes and interests, as defined by Perkins, Jay and Tishman (1993). It is unlikely that these dispositions can be captured by a behavioural format, or judged through a single performance (Billett 1997a). In addition, confidence that one performance could be used as a predictor of subsequent performances is unlikely, especially under different circumstances (e.g. a different type of cutting machine). Gleeson's (1993) study indicated that the values and attitudes associated with learners developing work identities were not being addressed in CBT approaches to curriculum. Yet, it is commonly understood that employers require particular sets of attitudes to be developed in their employees (Kingsland & Cowdroy 1993). So while CBT has utility for routine aspects of work practice, the cognitive psychology literature suggests that CBT alone is not a sufficient basis for instruction, curriculum development, and assessment in developing flexibility and adaptability. Yet even Rumsey's (1997) report to government on assessment procedures emphasises the use of behavioural outcomes.

While CBT focusses on outcomes it denies the importance of the processes underlying these outcomes. Whilst performance or outcomes (being able to do something) are important, it is the way individuals *use* knowledge that predicts their ability to *apply* knowledge under different circumstances and situations. For example, in most instances the first act of transfer is from the place where knowledge is learnt (e.g. the classroom) to other situations (e.g. the workplace). In what way can measurable performance in a classroom setting predict transfer elsewhere to other situations or tasks? Equally, in addressing workplace tasks it is individuals' use of their knowledge processes that is the strongest predictor of success. With a lack of emphasis on the very processes that underpin thinking and acting in curriculum intents (aims, goals and objectives), these process considerations are ignored. It is important to note that the transfer of individuals' vocational knowledge is not just about it being portable to other workplaces. Changes within workplaces or changes to the individuals' roles also require transferable knowledge.

Whereas behaviourists emphasise observable behaviour, cognitive theory has for the last 30 years been focussing on the internal processes of thinking and acting (e.g. Anderson 1993; Ericsson & Smith 1991; Glaser 1990; Newell & Simon 1972). Central to this inquiry has been the difference between the knowledge one has and how one uses it; whether one is an expert or a novice. Although unable to make the process of thinking observable, the evidence emphasises the use of knowledge processes in completing tasks and in learning. Recently these findings have been augmented by contributions from social and cultural theory which propose that knowledge is sourced and influenced by external factors. These theories highlight the reciprocal and interpretative nature of the relationship between individuals and their thinking and acting (Rogoff 1995). How individuals respond (think and act) is not linear, as behaviourists would have us believe. Differences are bound in the processes that individuals use to understand the knowledge with which they interact. This suggests that there is a need to account for the situatedness of learning; the fact that expertise is not unitary but is at least partly determined by the particular circumstances under

which individuals engage in activities (Billett 1995). Again, this view reinforces the importance of a more situated approach to curricula that is negotiated rather than mandated centrally. Of learning processes which are focussed on individuals' constructions of knowledge in, for example, problem-solving activities that are at a level which can reasonably extend learners' knowledge, rather than through 'chalk-and-talk' teaching alone.

The cognitive and social-cultural perspectives share a common 'constructivist' view, within which individuals are 'meaning-makers' who shape and interpret the stimuli they experience. In contrast to earlier views, which held that individuals internalise knowledge provided by an external source, the constructivist view proposes that individuals construct their understanding through a process which is analogous to problem-solving. Both perspectives value problem-solving as a means of instruction. This contrasts with views of the learner as a passive recipient of knowledge sourced elsewhere. For instance, McKavanagh and Stevenson (1994) have shown that those students in TAFE settings who are pressed into problem-solving activities are more likely to construct higher forms of procedural knowledge than those who participate in more ordinary forms of instruction. It seems that interactions with peers and teachers, as well as appropriately sequenced tasks, are likely to develop and hasten the development of the higher orders of knowledge required for performance. Instructional processes focussing solely on outcomes may not address such procedural concerns. Moreover, sociocultural theorists suggest that collaborative problem-solving with a more expert other, when undertaking authentic activities supported by the indirect guidance of social and cultural practice, is most likely to develop the knowledge required for performance in particular situations (Collins, Brown & Newman, 1989). Research in workplace learning has supported many of these contentions (Billett 1996). However, when the requirements by which vocational courses are to be accredited are examined, they make no reference to these concerns. They refer mainly to adherence to industry formulae and CBT formats (e.g. VETEC 1992).

Hence, at the centre of an evaluation of the efficacy of CBT is a debate between perspectives, which emphasise either internal processes (cognitive), and their relationship to social circumstances (sociocultural theory) or external manifestations of behaviour (behaviourist). However, there is some consensus in the educational psychology community that the key aspects of the behavioural view have now largely given way to more contemporary views (Thomas 1990). This development has also seen the transformation of psychology from a science that seeks to understand behaviour into one seeking to understand the mind.

Behaviourism still holds an important place in the development of routine skills in areas associated with disability, sports coaching, the rote learning of important knowledge which has no algorithmic frame (e.g. the alphabet), and also where knowledge is usefully learnt in this way (times tables). However, beyond these areas, other insights are commonly held necessary to inform how humans think and act.

It is unlikely that compulsory education or higher education will willingly embrace behavioural approaches to education, as its limitations are broadly recognised in these sectors. That VET is an exception only adds to the view that it is pragmatic, concrete and superficial—which it is not. The cognitive view, in highlighting the significant role of higher orders of knowledge, emphasises the role of processes in thinking and acting. Moreover, the cognitive literature offers accounts of the knowledge types required for expert performance (Stevenson & McKavanagh 1994; Stevenson 1994). The products of this literature can be used at least as a basis for appraising the prospects for the development of robust knowledge through the CBT approach to curriculum and instruction.

A clear depiction of the distinction between process and outcomes and the apparent contradictions between what governments want and the means by which they seek to achieve it can be found in the NTB's 1992 definition of competence. The NTB states:

> *The concept of competency focusses on what is expected of an employee in the workplace rather than on the learning process; and embodies the ability to transfer and apply skills and knowledge to new situations and environments.*
>
> (NTB 1992, p.29)

The complications and contradictions here are many. Firstly, what is expected of an employee is likely to be highly differentiated from workplace to workplace. Vocational practice is founded on situational expectations (Beven 1997; Stevenson 1996). It is acknowledged that expertise in one enterprise is likely to be inadequate in another and indulgence in a third (Billett 1995). For instance, being a successful waiter, hairdresser, or clerical worker is not premised on uniform requirements, except at the very abstract level (Beven, 1997) (e.g. determine what clients, customers and co-workers want and seek to provide that product or service). Rather, it is premised on what it means to conduct food service in a particular restaurant, dress hair in a particular salon, or work in a particular clerical situation; each having particular situational factors that are the basis for performance. Therefore, judgements about actual performance are likely to vary from situation to situation. Secondly, in embodying transfer and adaptability, yet denying the importance of the processes that permit these attributes, this definition ignores extensive research within cognitive psychology over the last 30 years.

Lest the work within cognitive psychology be dismissed as 'curiosity research', it is noteworthy that much of it has been funded by military and industry sources in the United States of America in the search for understanding best performance for military and commercial purposes (e.g. Lesgold, Gott, Glaser etc.). Indeed, a criticism of this work is that it has been too closely aligned with such pragmatic interests and that it has had a deleterious influence on compulsory educational policy. What the cognitive literature suggests is that the development of higher order procedures and richly associated conceptual knowledge is the most likely method of developing robust knowledge in individuals. For instance, it is fair to say that the USA military had previously favoured behavioural approaches to learning. However, given the increasingly indeterminate and uncertain arenas in which they now operate, and the nature of the equipment they use, they can no longer rely on the routine and the predictable (Gott 1995). Rather, they are seeking novel approaches to addressing their problems. In doing so they are turning away from a dependence upon behavioural prescriptions. Equally, the increasing competitive and uncertain circumstances that enterprises find themselves trading in demand creative and adaptive behaviour for many tasks (Rowden 1995). As noted above, many human resource development practitioners in the USA have disowned behaviourist approaches (Carnevale 1995; Tang & Cheung 1996; Wall & Jackson 1995). Hence, some of the institutional practices that are being maintained in this country seem at odds with transformation in practices elsewhere that are based on more current understandings of how individuals learn and employ knowledge.

This view suggests that it is necessary to examine curriculum documents and materials such as those used for accreditation procedures to determine the types of knowledge they depict and value in order to determine:

- the degree to which these documents emphasise outcomes and content that are likely to secure adaptability and skilfulness
- to what degree the benchmarks provided for assessment purposes are useful for making judgements about the skilfulness and adaptability are likely to be obtained

- to what degree the experiences mandated in accreditation frameworks emphasise the knowledge required for performance
- to what degree there is evidence that CBT has or has been unable to secure these forms of knowledge

From the above it seems the concerns for the projects are as follows.

Curriculum development—In what ways does the model of curriculum development and instructional environment lead to the sorts of activities that are likely to secure the kinds of knowledge required for skilfulness in the workplace? Can a CBT-based curriculum guide learning arrangements to secure these forms of knowledge, and if so in what ways? By emphasising measurable outcomes of learning (behaviour), important process skills are not being addressed. Included in this category are the dispositional dimensions of practice, which are important for the values and attitudes associated with performance to be constructed (Billett 1997a; Gleeson 1993).

Assessment—Will the assessment processes being used in CBT permit judgements about the forms of knowledge required for workplace performance, which are flexible and adaptable? There is a concern that even the first basis for transfer may not be addressed in assessment practices based on measurable performance in school-like activities. Hence, the validity of assessment associated with behavioural processes is questioned. CBT has been held to be more of an assessment system than one concerned with improving cognitive skills (Barratt-Pugh 1996). Quantitative assessment may encourage students to merely reproduce knowledge rather than develop structured reflective argument (Biggs 1994).

Instructors' role—To what degree has CBT permitted or inhibited instructors to secure in their students the knowledge required for adaptability and flexibility? Understanding the process of the development of expertise is central to the development of quality instructors (Cornford 1993). Instructors using the competency-based approach will not be addressing enterprises needs if they are unable to develop critical thinking skills (Field 1996).

The sections above have provided a commentary on some of the issues associated with the changing institutional structures resulting from CBT and its educational worth. Arising from this review is the need to appraise further some of these ideas. In the next chapter the methodology which builds upon the work here is advanced.

3 Procedures for data gathering, analysis and integration of sub-projects

Fred Beven and Sharon Hayes

The project proceeded as two parallel investigations occurring in both Victoria and Queensland, each comprising three sub-projects. However, the sub-projects in each State worked closely together for this consolidated report (see figure 3.1). The sub-projects drew collectively upon the literature review in chapter 2 to develop the initial background and proposals offered in chapter 1. The data sources in each of the two States are also common across the sub-projects (e.g. oral histories, focus groups, interviews and surveys etc.).

In each of the sub-projects there has been a dual concern with changes to the institutional context that have been realised by CBT (changes in practice) as well as those concerned with the educational worth of CBT (e.g. can its assessment/instructional/curriculum practice secure flexibility and adaptability?).

Therefore, in overview, and as indicated in figure 3.1, the research focusses upon completion of the three separate sub-projects in addressing their separate questions by drawing upon a common literature review and common data sources in each of the two States. The three tables that follow depict how each sub-project focusses on its dual themes and indicates relevant data sources as well as methods for gathering data.

These tables show how key themes and concerns identified in chapters 1 and 2 are used to focus the areas for inquiry in each of the sub-projects. These concerns are divided into those that refer to the changes in institutional context wrought by CBT and those that address the educational worth of CBT. The sources of data referred to in each of the sub-projects build upon those available from the literature review, which include earlier empirical work (studies that report data) and access to informed accounts. The sources referred to in these tables are:

- TAFE teachers
- labour market programs e.g. Skillshare and those in workplaces
- curriculum officers in TAFE or State training systems
- students
- local enterprises
- ITAB representatives

Added to these are curriculum documents and accreditation documents. The methods by which data were gathered comprise focus groups, oral histories, interviews, document analyses, student experience surveys and focus group/workshops. In figure 3.1 the associations between sources and method are summarised.

A strength of this approach to the investigation is the capacity to triangulate the data in a variety of ways. Not only is data derived from a variety of sources a strength, the capacity of individual researchers to examine and interpret that data in different ways, and from different research paradigms as sub-projects, is a strength also. Thus the study seeks to use multiple sources and multiple research perspectives to address what is a set of complex research questions. It is acknowledged that such an approach might lead to overlap of analysis in the sub-projects, however, this is considered to be a strength rather than a problem.

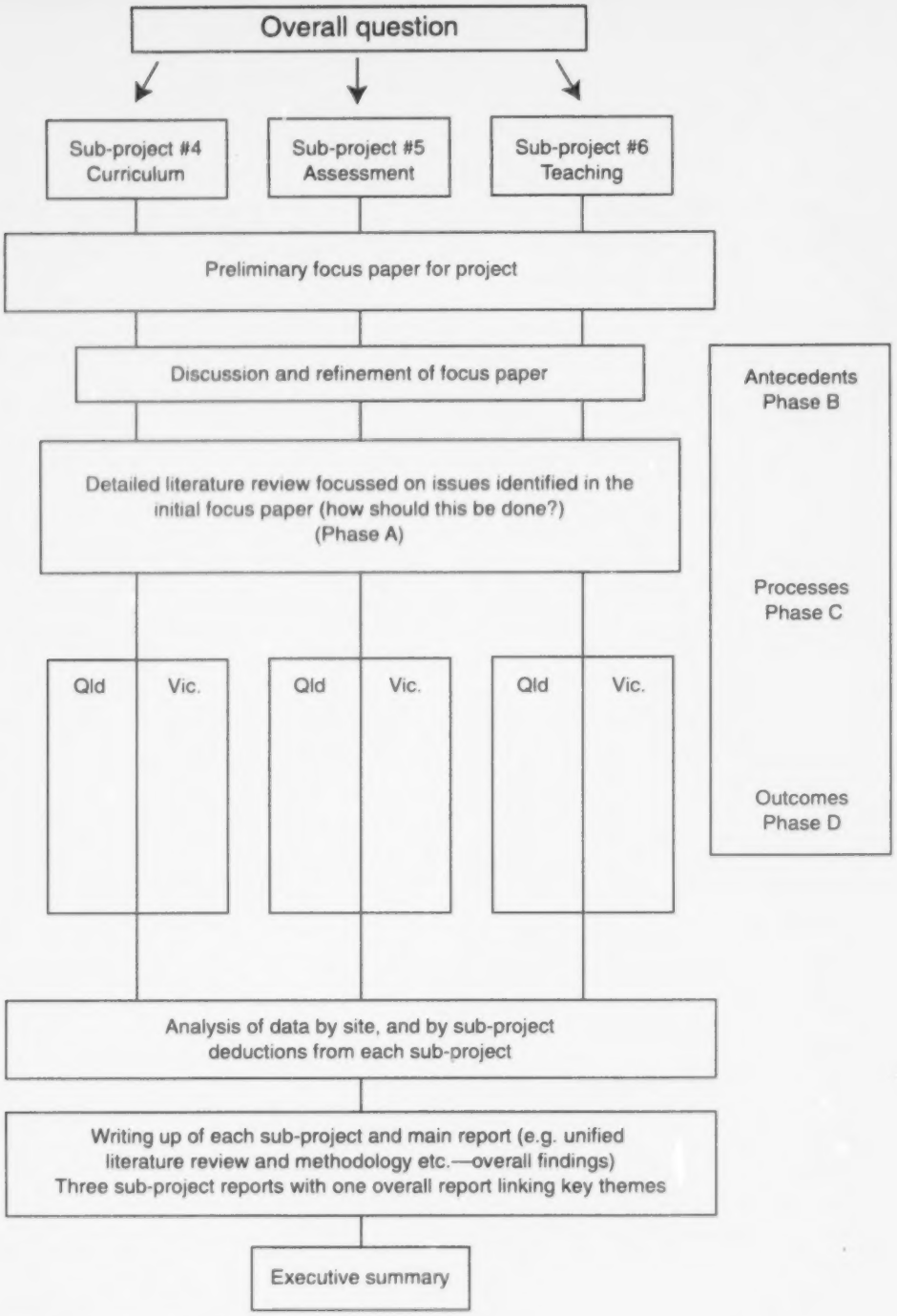

Overall question
Sub-project #4 Curriculum
Sub-project #5 Assessment
Sub-project #6 Teaching
Preliminary focus paper for project
Discussion and refinement of focus paper
Detailed literature review focussed on issues identified in the initial focus paper (how should this be done?) (Phase A)
Qld
Vic.
Qld
Vic.
Qld
Vic.
Antecedents Phase B
Processes Phase C
Outcomes Phase D
Analysis of data by site, and by sub-project deductions from each sub-project
Writing up of each sub-project and main report (e.g. unified literature review and methodology etc.—overall findings) Three sub-project reports with one overall report linking key themes
Executive summary

Figure 3.1: Procedure for study

Data gathering

As outlined in chapter 1 the purpose of the project was to seek understanding of the contemporary and likely future requirements for VET curriculum, assessment, and instruction, and compare these with the antecedent conditions that were present at the time of inception of CBT. The main dimensions of the study are the sub-projects (#4 curriculum, #5 assessment, #6 instr uction) and time (antecedents, processes, outcomes, futures). *Antecedents* are taken to mean the conditions before a *uniform national system of*

CBT was implemented. This implementation occurred on different time scales for different stakeholders. *Processes* are roughly equivalent to the 'institutional practice' and *Outcomes* to the 'achievement of the educational goals'. The processes refer to the way curriculum is developed and implemented by institutions and outcomes are viewed in terms of the individual, group (educational institutions and industry) and society. In the context of employment, the individual refers to the trainee, the group to the enterprise or industry and the societal level to the whole nation. These relationships are depicted in table 3.1, together with the code for each category.

Table 3.1: Categories and codes for antecedents, processes, outcomes and futures

Antecedents	
Code	**Category**
AC	Curriculum
AA	Assessment
AI	Instruction
Processes	
Code	**Category**
PN	Establishing needs
PC	Curriculum design and accreditation
PI	Instruction and learner support
PA	Assessment and reporting
PE	Evaluation
Outcomes	
Code	**Category**
OS	Social concerns (society/national)
OC	Competitiveness (group/industry)
OL	Learning and training (group/institutions and workplaces)
OK	Skillfulness (individual/trainee)
Futures	
Code	**Category**
FI	Instruction
FA	Assessment
FC	Curriculum

There were six instruments developed. The instruments and the groups to which they were administered are shown in table 3.2.

Table 3.2: Instruments and the target groups

Code	Instrument	Target groups
HT	TAFE teacher histories	Teachers in each industry and both States
II	Interviews with industry reps	Curriculum officers and ITAB representatives in each industry and both States
IE	Interviews with local enterprises	From each industry in both States
FT	TAFE teacher focus groups	From each industry in both States
FN	Non-TAFE focus group/workshops	High schools, labour market programs, private providers, workplaces —from each industry and both States
ST	Trainee surveys	Multiple TAFE and non-TAFE classes from each industry in both States

A set of questions were developed from the literature and mapped against both the time dimensions outlined in table 3.1, and target groups outlined in table 3.2. These maps are presented in tables 3.5, 3.6, 3.7, and 3.8 at the conclusion of the chapter.

Sources of data

Sources of data were carefully planned in advance and every effort was made to gather the data as planned. Some limitations were encountered (discussed below) and the actual data set analysed is outlined in table 3.3.

Table 3.3: Method, sources, planned, and achieved numbers of sources in overview

Method	Source	Planned per State	Achieved per State
Focus groups	TAFE teachers	2 focus groups (1 metropolitan and 1 non-metropolitan) for each industry	All achieved
Oral histories	TAFE teachers	4 per State (2 per industry)	All achieved
Interviews	Curriculum Officers, ITAB representatives, local enterprises	1 per industry per State (2) 1 per industry per State (2) 2 per industry per State (4)	All achieved
Student experience surveys	Students	6 classes in each industry both metropolitan and non-metropolitan 6 classes in non-TAFE environments as appropriate both metropolitan and non-metropolitan	Not fully achieved. See table 3.4 for details
Focus groups/ workshops	Instructors from labour market programs, private providers	2 focus groups (1 metropolitan and 1 non-metroplolitan) for each industry	All achieved, however, some no shows occurred with some groups

The data gathering was undertaken in a metropolitan and non-metropolitan site in both Queensland and Victoria. The data gathering in each State addressed the requirements of each of the three sub-projects as a means of maximising efficiencies. So for example, schedules of questions or issues addressed in the focus groups, interviews and oral histories were used to elicit data on the impact of CBT on curriculum (#4), assessment (#5) and teaching practice (#6).

Procedures in detail

This section seeks to detail the procedures to refine the gathering and analysis of data.

Sites and subjects

In either State both metropolitan and non-metropolitan sites were selected. In Queensland, the metropolitan site was Brisbane and the non-metropolitan site was Rockhampton. In Victoria, the sites were Melbourne and non-metropolitan Gippsland. In non-metropolitan Victoria, Bendigo/Ballarat was later added as an additional non-metropolitan site in order to overcome difficulties with the lack of suitable providers in some categories.

Some data were collected at State level (e.g. ITAB representatives and TAFE curriculum officers). Metals and hospitality were the targeted industries for the project. The former was at the forefront of moves to implement CBT, and has been offered as the archetype industry, whereas the latter, service-based industry represents a different kind of industry in terms of focus, orientation and private provision.

In identifying possible sites it was important to provide a comparison between the influence of CBT in both metropolitan and non-metropolitan locations, the requirements for curriculum development, assessment and teaching in those locations

as well as across the two industry sectors. However, the data gathering did not seek to be wholly representative because it is simply not possible or practical to capture detailed data across a broad spectrum of industries and locations. Rather, in both metropolitan and non-metropolitan settings, data were gathered to represent perspectives of local TAFE, private providers, labour market programs, teachers and students (where appropriate) in those institutions, and local enterprises. So, for instance, in each metropolitan setting TAFE institutes, private providers, local labour market program providers and enterprises that undertook programs for each industry were approached. The actual numbers of subjects at each site is presented in table 3.3. Wherever possible (and where appropriate) subjects whose experiences stretched over and past the decade of CBT (1989 – 1997) were chosen. Because CBT originated in the TAFE sector this was easier to achieve in TAFE than amongst private providers.

Orientation to data-gathering

The data gathering addresses sets of concerns that have been identified in the preliminary discussion and review of the literature (chapters 1 and 2). These concerns, which are summarised in table 3.9, 3.10, and 3.11, were used to focus the data gathering and analysis. The data gathering sought to go beyond gathering the opinions of the subjects. It is evident in the review of the literature that the collection of verbal data dominates the previous work on CBT. Hence, the current project's aim was to make use of additional data. In particular, document analyses were undertaken to determine the intentions of policy makers and other sponsors of CBT. Documents analysed include State-based curriculum documents and material, accreditation guidelines and proformas, assessment guidelines and policy documents. In addition, data about the qualities of learning environments that are currently being deployed in vocational education environments were gathered and used to make judgements about the likelihood of securing the forms of knowledge required for skilfulness. This was achieved using a student survey.

However, to contextualise this analysis, it was also necessary to gather data in the form of focus groups, oral histories, interviews and focus group/workshops. The intention was to make this data grounded and support it with additional contextual information to 'objectify' the data and to avoid it being dismissed as mere opinion. In addition, triangulation of the data was achieved by addressing a similar set of concerns from a number of sources (see tables 3.5, 3.6, 3.7, and 3.8). This was not intended to secure a consolidation of single views from different sources, but rather to examine a range of data about the same concern for the purpose of authenticating the data. The processes used for this task are now detailed.

Focus groups

Focus groups were conducted among TAFE teachers and private providers. Between four and eight participants were sought for each focus group, but the actual numbers in some cases were lower due to attrition. The points of convergence for the focus groups is reflected in table 3.12 (appendix 1), which aggregate areas of concern across the three sub-projects. These concerns furnish items that were addressed in the schedules for the focus groups. Teachers' focus groups consisted of half-day activities that included some scene setting followed by the presentation of a set of issues for discussion. The issues were generated from table 3.12. While the scene setting was considered an important element, employed to contextualise the data by associating it with actual events, it was found that most of the focus group participants had sufficient (and oftentimes extensive) knowledge and experience of the processes and context surrounding the implementation of CBT. The use of instruments such as 'activity sheets' to delineate teaching activities and the degree by which they have been transformed

by the enactment of CBT were also an important element of the focus groups. It was intended that video footage recorded in 1990 would be used to focus the groups' responses to the items, but again—at least in Queensland—it was found that the level of awareness amongst participants was such that the video footage was redundant. The data gathered from the focus groups comprised of summaries of responses including responses to activity sheets and conversations recorded on audiotapes.

Oral histories

Four oral histories were developed—two from each industry—in each State. The procedure consisted in identifying subjects who could provide accounts of the changes in teaching, assessment and curriculum practice as a result of the implementation of CBT. All the oral history respondents had been engaged in teaching across the decade of CBT, and often long before it. The subjects were interviewed using the items from table 3.13 (appendix 1) and were also recorded on audiotape, which were later transcribed and lightly edited. Transcripts were then returned to the subject with requests for corrections and embellishments (e.g. examples and instances). These histories were aligned to the data from the focus groups and interviews to assist triangulation of the data.

The data were therefore gathered in the form of oral histories of the unfolding implementation of CBT and its implications for curriculum, assessment and teaching. Collectively, these histories form a set of rich accounts of CBT which were accessed by each of the projects.

Interviews

Lengthy interviews were conducted within each of the two industries in each of the two States to gauge views of the utility of CBT in addressing industry's needs. In each State, a representative from the ITABs for both industries and a curriculum officer from each industry were interviewed. In addition, representatives from two enterprises in each industry were interviewed to provide enterprise perspectives. The schedules for the interviews were drawn from the concerns stated in table 3.15 (appendix 1). As for the oral histories, wherever possible, subjects were chosen for their experience in training during the CBT decade and were able to provide insights about the evolving needs of 'industry' and how policy prescriptions in recent times have swung to address needs of enterprise bargaining. Again, instances and examples were requested during the interviews to ground the subjects' responses. In addition, industry representatives were asked for (and most provided) additional material such as industry surveys, documents, and reports to support their claims.

The data for this group is in the form of summaries of the interviews organised under items in the schedule. This data is organised in such a way as to make it comparable with data gathered from other sources relating to the same concerns. Again, this is not to seek an aggregation of views but to permit different perspectives and sources of data to play on the same area of concern.

Focus groups/workshops

Focus groups/workshops were also used to gather data from instructors in labour market programs and private providers for each industry in both metropolitan and non-metropolitan settings. As predicted, there were fewer non-TAFE providers in the regional centres compared with the metropolitan centres. Nevertheless, the team managed to secure an adequate number of participants for each scheduled focus

group, and the data were in no way compromised by a lack of regional participants. Between four and eight participants were sought for each focus group and the response was generally positive. However, in several cases, some participants failed to show up for the focus groups, resulting in two or three groups going ahead with only two or three participants. The focus for the groups is reflected in table 3.15. This table details the aggregated areas of concern across the three sub-projects. These concerns show items addressed in the schedules for the focus groups. The focus groups were half-day-long activities including some scene setting followed by discussion of a set of issues relevant to the participants' experience with CBT. The scene setting was initially considered to be important to contextualising the data by associating it with actual events. However, it was subsequently found that most of the focus group participants had sufficient experience and knowledge of CBT and its implementation, and such scene setting was kept to a minimum. Consequently, video footage recorded in 1990, which had been intended for this purpose, was in many cases judged to be redundant and was not used. 'Activity sheets' were used to record participants' teaching activities and the degree to which they have been transformed since the implementation of CBT.

The data gathered at these focus groups will comprise summaries of responses including responses to activity sheets and other sources.

Student experiences surveys

To gather data about how the curriculum practices under a CBT framework have affected classroom activities a questionnaire was devised and administered in various vocational education settings. It comprised a student experience survey; the Workplace learning environment questionnaire (McKavanagh, 1995; McKavanagh & Stevenson, 1994), together with an additional questionnaire drawn from the concerns summarised in table 3.14 (appendix 1). These questionnaires were administered in several TAFE classes using a CBT approach in each industry, in both metropolitan and non-metropolitan settings. Where possible, the instrument was also administered to classes utilising a CBT approach in non-TAFE environments for each of the two industries in both metropolitan and non-metropolitan settings. While private providers were extremely co-operative in assisting the team in distributing the questionnaires among non-TAFE trainees, students in the metals industry were either training on the job, or in secondary schools. Those under 18 years of age in secondary schools were required to take consent forms home for their parents to sign, while on-the-job trainees in the metals industry were often scattered around several or many employers. These differences resulted in few returns from non-TAFE students for that industry. Non-TAFE students in hospitality tended to train in private colleges, and were usually 18 years of age and over. This group, therefore, was much more easily accessible, and yielded a high survey return. The actual returns of questionnaires across the study are outlined in table 3.4

Table 3.4: Questionnaire returns by the project

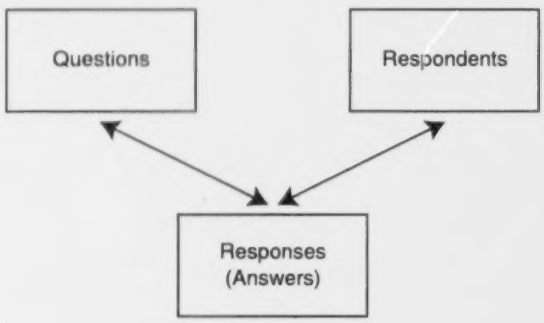
	Queensland						Victoria				
	Metropolitan			Non-Metro			Metropolitan			Non-Metro	
	Hospitality		Metals	Hospitality		Metals	Hospitality	Metals		Hospitality	Metals
	Non-TAFE	TAFE	TAFE	Non-TAFE	TAFE	TAFE	TAFE	Non-TAFE	TAFE	TAFE	TAFE
Un		5									
Fem	26	5		9	36					7	
Male	13	7	29		17	35		20	15	7	31
Total	39	17	29	14	54	35	10	20	15	15	31

The Workplace learning environment questionnaire is self-administered. A research assistant was present in most cases to answer queries about its administration. In the non-TAFE groups, especially in the metals industry, this was often not possible due to the scattering of students across a large number of employers. In such cases, their private providers were briefed about the survey, and administered it to those students on our behalf. The completed instruments were entered into a database for analysis. Numerical data was analysed using a standard statistical package (SPSS)

Data management

The data were entered into an electronic database that permitted ease of management. The data set (excluding quantitative data) comprised of 3390 (answers) from 351 respondents in response to differing sets of the 41 questions. Data input could be partially controlled by the database. For example, it was not possible to enter more than one answer to a question from any respondent. Further, some input fields could be controlled to accept only valid data. For example, respondent types could only be coded with legitimate codes HT, II, IE, FT, FN, and ST (see table 3.2 for an explanation of codes). The data set was structured as outlined in figure 3.2:

Figure 3.2: Structure of data set



This structure permitted the data to be accessed in a variety of ways. For example, it was possible to produce electronically, tables of answers from enquiries such as:

- List all responses to Question 4 by industry by State
- List all responses to Question 6 by Non-TAFE students
- List all responses to Question 10 TAFE teachers

Strengths and limitations

A strength of this investigation is the capacity to triangulate the data in a variety of ways. The multiple sources of data, the capacity of individual researchers to examine and interpret that data in different ways through different research paradigms, the mixed methodology (quantitative and qualitative data), the smaller cohort (carefully planned in advance) and greater depth of analysis all contribute to this triangulation. The capacity to gather data face to face, rather than by telephone interview for example, added considerable richness to the data set.

It is acknowledged that this approach might lead to overlap of analysis in the sub-projects, however, this has strengths as well as problems. Further, the small number of respondents might be seen as a limitation, however, this has been offset by a capacity to engage in a greater depth of analysis. In other words, what is reported later is not just what people say, but also why people say they agree or disagree. It is further acknowledged that the lack of respondent numbers in some places might place limitations on the fidelity of some aspects of the analysis.

Explanatory tables

The final section of this chapter presents tables that detail the three sub-projects in terms of concerns, data sources and methods for gathering data and have been variously referred to in this chapter. It is possible to see the way that each project's needs were addressed and which data sources are being used to address concerns. Tables 3.5, 3.6, 3.7, and 3.8 present the sets of study questions, sequenced in a time dimension, and mapped against the target groups. Tables 3.9, 3.10, and 3.11, outline the concerns that have been differentiated into those referring to the effects of institutional practice by CBT and those referring to its educational worth.

The final set of tables (3.12, 3.13, 3.14, 3.15, 3.16, and 3.17) can be found in appendix 1 and detail the concerns and items highlighted earlier. These tables are organised by the method of data gathering, indicating the concerns to be addressed, which sub-project they pertain to, and the items used to elicit the data.

Table 3.5: Antecedents, questions and target groups

AC Antecedents: Curriculum	**HT**	**II**	**IE**	**FT**	**FN**	**ST**
These are questions about how curricula were designed before CBT.						
Before CBT was implemented:						
What was your role in the development of training programs?	Y	Y	Y			
What was your role in the provision of training?	Y	Y	Y	Y		
How was your role influenced by the relationship between industry and training providers?	Y	Y	Y	Y		
What did you know of competency-based training?	Y	Y	Y	Y	Y	
AA Antecedents: Assessment	**HT**	**II**	**IE**	**FT**	**FN**	**ST**
These are questions about how assessment was carried out before CBT.						
Before CBT was implemented:						
What was your role in assessment?	Y	Y	Y	Y		
What were the strengths of assessment practices?	Y	Y	Y	Y		
What were the problems with assessment practices?	Y	Y	Y	Y		
How were student achievements recognised?	Y					
AI Antecedents: Instruction	**HT**	**II**	**IE**	**FT**	**FN**	**ST**
These are questions about how teaching/training was carried out before CBT.						
Before CBT was implemented:						
What was your role in teaching/training?	Y					
To what degree did you enjoy freedom in what was taught and how it was taught?	Y			Y		
To what degree were you responsive to syllabus requirements?	Y			Y		

Table 3.6: Processes, questions and target groups

PN Processes: Establishing needs	**HT**	**II**	**IE**	**FT**	**FN**	**ST**
The next set of questions is about changes to the way training needs are established.						
As CBT was being implemented:						
What changed in the ways training needs were established in your industry?	Y	Y	Y			
PC Processes: Curriculum design and accreditation	**HT**	**II**	**IE**	**FT**	**FN**	**ST**
The next questions are about changes in the way courses are designed and accredited.						
As CBT was being implemented:						
How did the changes in curriculum organisation affect your work?	Y	Y	Y	Y		
How did the processes of accreditation change your work?	Y	Y	Y	Y	Y	
PI Processes: Instruction and learner support	**HT**	**II**	**IE**	**FT**	**FN**	**ST**
The next questions are about how instruction and support for learners has changed.						
As CBT was being implemented:						
What effect was there on the support given for learning?	Y		Y	Y		
PA Processes: Assessment and reporting	**HT**	**II**	**IE**	**FT**	**FN**	**ST**
The next questions are about how assessment changed.						
As CBT was being implemented:						
In what ways were your assessment practices changed?	Y	Y	Y	Y	Y	
How were changes in assessment practices brought about?	Y	Y	Y	Y	Y	
PE Processes: Evaluation	**HT**	**II**	**IE**	**FT**	**FN**	**ST**
The next questions are about how processes for evaluating training have changed.						
As CBT was being implemented:						
How have processes for evaluating training changed?	Y	Y	Y			
What does CBT mean to you?	Y	Y	Y	Y	Y	Y

Table 3.7: Outcomes, questions and target groups

OS Outcomes: Social concerns (at a national level)	**HT**	**II**	**IE**	**FT**	**FN**	**ST**
The next questions are about the most worthwhile outcomes from vocational education reforms in Australia.						
Currently:						
What evidence is there that CBT has changed VET practice for the better or worse?	Y	Y	Y			
In what ways are new relationships among industry, training personnel and trainees productive or unproductive?	Y	Y	Y	Y	Y	Y
In what ways have processes such as RPL and articulation improved or inhibited career development?	Y	Y	Y	Y	Y	Y
In what ways has greater uniformity of training been achieved?	Y	Y	Y	Y	Y	
What recent changes to training and assessment have affected you most?	Y	Y	Y			Y
OC Outcomes: Competitiveness (of enterprises and industries)	**HT**	**II**	**IE**	**FT**	**FN**	**ST**
The next questions ask about the ways in which VET reforms have changed the competitiveness in your industry.						
Currently:						
What evidence is there that changed training practices are developing skills that improve competitiveness?	Y	Y	Y	Y	Y	
What evidence supports the claim that enterprise/industry goals are being met?	Y	Y	Y	Y	Y	Y
OL Outcomes: Learning and training (in educational institutions and workplaces)	**HT**	**II**	**IE**	**FT**	**FN**	**ST**
The next questions ask about the ways in which reforms have changed educational institutions and training practices.						
Currently:						
What evidence is there that learning by trainees has improved?	Y	Y	Y	Y	Y	
In what ways are the links between assessment and credentials (certificates) important?	Y	Y	Y			Y
How does a non-graded pass approach influence motivation to learn?	Y	Y	Y	Y	Y	Y
Can you provide examples of how training and assessment practices address the needs of trainees and employers?	Y	Y	Y	Y	Y	Y
Can you provide examples of how reliability and validity of assessment are established?	Y	Y	Y	Y	Y	
Can you give examples of how your work as a trainer has changed?	Y					
What educational principles and practices are new training methods and materials based on?	Y	Y	Y	Y	Y	
OK Outcomes: Skillfulness (of trainees and employees)	**HT**	**II**	**IE**	**FT**	**FN**	**ST**
This set of questions asks about the ways in which trainees and employees trained under the reformed vocational education system are knowledgeable and skillful.						
Currently:						
In what ways are trainees able to solve problems on their own or collaboratively?	Y	Y	Y	Y	Y	Y
What interactions between industry and instructors are valuable in promoting skillfulness in trainees?	Y	Y	Y			
In what ways are employees trained under the new VET system knowledgeable and skillful?	Y	Y	Y			
What evidence is there that trainees are able to transfer knowledge and skills to new situations and changed work practices?	Y	Y	Y			Y

Table 3.8: Future directions, questions and target groups

Next consider the future of VET beyond current limits:	HT	II	IE	FT	FN	ST
FI Instruction						
How would you change instruction to best develop student learning?	Y	Y	Y	Y	Y	
FA Assessment						
How would you change assessment to both improve and acknowledge student performance?	Y	Y	Y	Y	Y	
FC Curriculum						
How should curriculum be best developed for your industry/enterprise?	Y	Y	Y	Y	Y	

Table 3.9: Project curriculum development—in what ways has the CBT as a model of curriculum been able to address the needs of industry and enterprises and the aspirations and needs of Australians in VET?

Institutional practice influenced by CBT
Concern
Influence and role of national standards on CD
Influence and role of accreditation procedures on CD
Bi-partite industry influence on CD
Teachers' fidelity to what was proposed in syllabus
Addressing local enterprises' needs under CBT
Addressing individuals' needs under CBT
Ability of CBT to provide uniformity
Impact of behavioural objectives on CD
CD practice in non-TAFE environments (Skillshare, workplace)
CD practice in TAFE
Educational worth of CBT
Concern
How it addressed needs of 'industry'
How it addressed needs of local enterprises
How it addressed needs of individuals
Purposefulness of behavioural objectives (delivering flexibility and adaptability)
Ability to address diverse needs (Skillshare, workplaces, TAFE)

Table 3.10: Project assessment practices—how have competency-based assessment practices been able to furnish information about individuals' achievements against benchmarks, thereby permitting judgements about student performance, credit and prior knowledge?

Institutional practice influenced by CBT
Concern
Impact of non-graded pass
Assessment practices in TAFE environments
Impact of associated assessment practices (e.g. RPL)
Assessment practices in other environments (Skillshare, workplaces)
Use of behavioural objectives
Educational worth of CBT
Focus
Behavioural objectives: validity and reliability
Achievement of uniformity (reliability)
Utility of CBA to judge higher order procedures and deep conceptual knowledge (non-quantifiable outcomes)
Securing validity across diverse assessment situations (Skillshare, workplaces)
How to assess higher order procedures and deep conceptual knowledge (non-quantifiable outcomes)
How to improve reliability in diverse circumstances
Upon what should assessment focus

Table 3.11: Project teaching practice—how has the implementation of CBT influenced the practice of instructors in VET? (Major Project 6)

Institutional practice influenced by CBT
Concern
Impact of CBT on teaching practice in TAFE settings
Impact of CBT on instructional practice in non-TAFE settings (Skillshare, workplaces)
Impact of modularisation and self-pacing
Impact of accreditation frameworks on instruction
Influence of behavioural objectives
Teachers as implementers
Educational worth of CBT
Concern
Appropriateness of CBT for developing skilfulness and adaptability
Utility of CBT for diverse instructional settings—(TAFE, Skillshare, workplaces)
Consequences of teacher as an implementer
Opportunities for students to engage in joint problem-solving etc.
Provision of guidance

4 CBT as a model of curriculum development

Stephen Billett

This sub-project focusses on the effects of CBT on curriculum. In all, seven major findings arose out of the empirical data collected. First, it was found that many respondents had some general difficulty in separating the influence of CBT from other influences. Some components of current curriculum practice are closely identifiable with CBT and provide a basis to make judgements about its worth. Other components are part of the 'CBT movement' and are associated with implementation and concerns about containment of costs and flexibility of access (e.g. self-paced activities, individualised learning arrangements). So in reaching conclusions about the impact and efficacy of CBT it is necessary to consider those factors most central to CBT, those associated with it and those that are not part of the 'CBT movement'.

Secondly, the two States studied had different bases for the uniform introduction of CBT. At that time different antecedent conditions existed between States and sectors. For example, an instructional system that is analogous to CBT was reported as being in use in the trade areas in Victoria since the early 1980s, while in Queensland, respondents reported little knowledge of CBT prior to its implementation in that State. Consequently, the transformations brought about by CBT for the two States and the two sectors were different. Overall, however, comparisons between teachers' activities prior to and after the implementation of CBT suggest that many teacher activities have not been changed by CBT.

Thirdly, it was found that changes to curriculum intents and content, and the introduction of the VET market, have fostered closer relationships between providers and enterprises. However, the findings on the quality of negotiations suggest they are rather one-sided, with a principal focus on the needs of enterprises.

Fourthly, the data suggest that greater uniformity has not been achieved through CBT. Beyond interpretative concerns, which refer to usage of materials and their interpretations, it was found that because industry standards vary from situation to situation, the prospect for uniformity is illusory. Moreover, there is no effort being made to determine uniformity of assessment through, for example, moderation processes, which are usually regarded as a means to secure reliability in assessment. Indeed, it is claimed that the level of contacts among vocational institutions has declined. Competition has encouraged this isolation. However, greater uniformity seems to have been achieved in assessment across both industries and both States.

Fifthly, these findings suggest that current vocational arrangements meet some enterprise needs in terms of the skills they require. Knowing about, and being able to meet enterprises' needs, as well as and those of individuals, is one of the most significant reasons why CBT is to be valued. But it is uncertain whether this satisfaction stems from CBT itself or associated initiatives.

Sixthly, there is evidence of CBT improving competitiveness, but mostly for enterprises, rather than individuals or industries as a whole. The curriculum processes that aided competitiveness have been categorised as work-based learning and improved access to training. It is also proposed that the market-based provisions have

been useful in enhancing competitiveness and that evidence of the efficacy of these arrangements is founded in enterprises continuing to employ apprentices and send them to the providers.

Finally, there is conflicting evidence concerning the ability of CBT to develop higher order outcomes and transfer through current curriculum practice. In terms of the development of higher order outcomes, the clearest pattern of evidence suggests that a series of instructional activities and unintended processes and factors engage students in problem-solving activities that are likely to secure the knowledge for adaptability. However, a smaller body of evidence suggests that there are limited positive outcomes. The important finding here is that the kinds of experiences the students are engaging in seem likely to be a useful source of higher order outcomes. However, the question remaining to be addressed further is the degree that these are the direct product of CBT or are they the product of other, associated processes. The potential for the CBT curriculum to deliver transfer is also evident. However, again, much of the basis of that transfer is not directly linked to CBT, but activities and experiences as the curriculum is enacted by teachers and experienced by students. Statements of evidence contesting transfer relate to the quality of training and the relevance of what has been learnt during the program.

Overview

The government policy of achieving a nationally uniform provision of vocational education, able to secure a skilful and adaptable workforce, was to be realised through the implementation of a competency-based training system. As discussed in chapter 2, it was intended that this initiative would have far-reaching implications for vocational education. These included how curriculum was to be enacted and what outcomes were to be valued. Drawing on discussions about the intended role of CBT as a means for reforming the vocational education system, this chapter analyses and makes deductions from that section of the data referring to the implications for curriculum. Data referring to the educational worth of CBT is also analysed and discussed from a curriculum perspective. This is done by identifying the outcomes of the implementation of CBT and how these outcomes meet the needs of industry, enterprises and those individuals who participate in vocational education. In doing so, principal concerns of sub-project #4, and its research question are addressed:

> *In what ways has CBT as a model of curriculum been able to address the needs of industry and enterprises and the aspirations and needs of Australians in VET?* (Major Project 4)

This question directly contributes to the overall goal of the investigation, by identifying:

- the consequences of the introduction of CBT for two industry sectors
- CBT's impact on curriculum practice
- how CBT meets the needs of enterprises, industry and those involved in learning through vocational education

In doing so, this curriculum initiative and the associated procedures of the 'CBT movement' are assumed as being developed and implemented with particular intentions, as outlined in chapter 2. These intentions necessarily form the basis of its appraisal. Consequently, this chapter addresses issues associated with the impact of the implementation of CBT as a model of curriculum and the educational worth of this curriculum model. In short, the focus of this sub-project is on:

- To what degree has the introduction of CBT influenced curriculum practice?
- What evidence is there of the educational worth of CBT?

Appraising CBT as a model of curriculum

To appraise CBT as a model of curriculum, it is worthwhile briefly revisiting what comprises this model of curriculum. As proposed in chapter 2, the CBT model of curriculum as it has been advanced in the decade of CBT, is 'technicist' (externally prescribed and behavioural in format) in orientation (Blachford 1986), and top-down in its implementation (Billett 1995). As depicted in table 4.1, in keeping with a technicist approach it is responsive to powerful external interests (government, industry), its goals are behavioural, its key focus is on objectives provided by others (government, industry), is psychologically behaviourist, and its assessment requires congruence with objectives (Blachford 1986).

In order to appraise this model of curriculum there is a need to go beyond what is intended or planned—the intended curriculum—syllabus, goals for learning and outcomes, regulatory mechanisms. In addition, what happens when the curriculum is implemented—the enacted curriculum—by teachers and trainers and also what learners experienced as a result of its implementation—the experienced curriculum—needs to be considered. The differences between these views of curriculum are significant for this project as they articulate concerns outlined in the research question. That is, they refer to the concerns of government and their industry partners (intents), the concerns of those who have to implement and enact the curriculum (teachers and trainers) and the experiences which lead to outcomes desired by those who participated in the programs and their sponsors. Upon the quality of these outcomes, judgements can be made about the efficacy of this model of curriculum.

In more detail, the intended curriculum is exactly that, what is intended by its sponsors and should happen as a result of the curriculum being implemented. These intentions are the goals set by policy, the aims for courses as well as detailed statements of intents (objectives) which are usually presented in the form of a syllabus and associated resource materials. Moreover, a number of regulatory measures were developed to maximise fidelity with the uniform implementation of a CBT curriculum. The intended curriculum also includes what teachers plan to do. The School-based curriculum development model (e.g. Skilbeck 1984) affords such discretion to teachers. Certainly, from the data here it seems that hospitality teachers were engaged in a college-based approach to curriculum development prior to the introduction of CBT. Indeed, many of the initial changes referred to below are about gaining control of the intended curriculum; its aims, goals, objectives and content. It seems that there was transformation for both sectors with the control of the intended curriculum to be taken from teachers and TAFE systems and given to the industry advisory bodies in order to secure greater responsiveness to industry needs.

Data analysis: CBT as a model of curriculum

In keeping with what has been proposed above, the presentation, analysis of and deductions from the data in this chapter are organised under three bases for analysis. These are the degree to which the introduction of CBT has influenced curriculum practice, evidence of the educational worth of CBT and views about alternate options. These data are presented to responses to three questions.

i) *To what degree has the introduction of CBT influenced curriculum practice?*

This question is addressed with reference to the data about antecedent conditions and procedures of implementation, also some referring to outcomes.

ii) *What evidence is there of the educational worth of CBT?*

This question addresses the educational worth of CBT with reference to data about processes, outcomes and futures.

iii) *What alternative approaches should be considered?*

This question seeks to address how curriculum provisions for vocational education should best proceed to achieve goals associated with delivering vocational education outcomes desired by industry, enterprises and those who participate.

How the introduction of CBT influenced curriculum practice: Antecedents

Teachers' prior knowledge of CBT

In order to understand teachers' knowledge of CBT as an antecedent condition to its national implementation, they were asked, 'Before CBT was implemented, what did you know of competency-based training?' (AC4). The responses are presented in table 4.2 (appendix 2).

The responses from teachers suggest that many of them knew nothing or very little of CBT prior to its implementation in 1990. However, it is more likely that a response about little or no prior knowledge of CBT would be from Queensland than Victoria. Moreover, in terms of knowledge of 'aims' and 'processes', the pattern indicated that those most knowledgeable would be from Victoria and in the metals sector. The difference between States and sectors is most apparent in 'knowledge of processes', whereas it was metals teachers from Victoria who claimed not only knowledge about its processes, but were also able to offer criticisms of its implementation.

These findings are hardly surprising considering the early involvement of the metals industry in the initial introduction of a national uniform approach to CBT reported in chapter 2. Moreover, it is reported that Victoria had a modularised CBT-based curriculum in the trade areas in the early 1980s (Mealyea 1985). In addition, the national focus on CBT expertise centred on Melbourne (e.g. Richmond). Presumably, this is why a number of Victorian respondents reported that they 'thought they were already doing it'.

Beyond responses claiming a lack of knowledge, were those indicating knowledge about the intentions of CBT ('knowledge of aims'), rather than matters associated with its successful implementation. As some Queensland respondents noted, 'the guides provided were not clear, people presenting did not seem too clear about it. Materials were not in CBT format. 'We were simply told of the new syllabus and told to make it work'. 'We knew very little, (but) later realised had been doing many aspects of CBT '. In recalling this situation, a Queensland metals teacher stated there was 'No consultation, no funding for resources, no planning to implement CBT and no input to its implementation'.

However, this confusion was not only noticeable in Queensland. A metals teacher from Victoria stated 'I think that a lot of us floundered with it at that initial stage. My perception at the time was that competency-based, was that somebody actually attains to that particular skill until they find competency. And the competencies were clearly stated then. And probably too clearly stated; "you will" and those sorts of terms, where there was some problems in the early stages of making statements like that, where, for arguments sake "you will remove a universal joint and replace it and it will effectively run". That's an easy statement, but how do you implement the damn thing?'. The reliance on external sources in the metals sector was also evident in Victoria. 'A lot of it came through Richmond TAFE in those days, an enormous amount came through Richmond. Mainly because they were the better at it, it was because they had in those days the most resources, in terms of staffing and so on. Once the

curriculum was developed, individual colleges developed the resources and that was done on a relatively good collective basis in those days, which was unusual. You don't see that happening now; everybody is doing it as a separate entity'.

Teachers' prior knowledge in sum

The important finding here is that these data indicate differences in the antecedent conditions in the two industries and between the two States at the time of the national implementation of CBT. There are at least four reasons why this is important. Firstly, quite different bases of knowledge existed prior to its implementation. These differences ranged from ignorance to those who had had experience with implementing a similar system. Hence, the assumption about achieving uniform goals was premised on quite different bases in both States and industry sectors. Secondly, the 'top-down' means of organising curriculum was perhaps more familiar in the metals sector than in hospitality. Hence, the changes required across the sectors are likely to differ, with those transformations in the hospitality sector being most profound. Thirdly, most of the initial trials and professional development support and materials were directed at the metals sectors and its teachers, whose needs may have been quite different than those in other sectors. Fourthly, assumptions that uniformity of provisions could be realised by edict seem quite naive given the differences in teachers' readiness for this initiative evident in the data. These concerns can be considered in terms of differences between the intended and enacted curriculum. If the process of implementation was machine-like, devoid of questioning and interpretation or need for information then fidelity of intents would be realised. However, the different bases of knowledge and values suggest that relationships between the intended and enacted are interpretative and likely to require negotiation.

Curriculum decision-making and structures

Metals in Queensland

Prior to the national implementation of CBT, much of the curriculum decision-making for the metals industry in Queensland was embedded centrally in the State's training system, with 'centrally-designed curriculum (being) handed down for teachers to follow'. Teachers' practice seemed accustomed to this arrangement as 'it was common practice for teachers to rely on external notes from the Technical Correspondence School'. The teachers were therefore cast as implementers of decisions made elsewhere. 'I had some involvement in the curriculum, but mostly my role was in the delivery of training'. The role that centralised prescriptions played in organising instruction within this sector extended to centrally organised assessment procedures. 'Exams were also set centrally, so teachers used to go through past papers to know what to teach. Questions did not change dramatically over the years so it was possible to use the past exam papers to work out what to emphasise'. Consistent with the centralised approach to curriculum provisions, uniformity of provision and outcomes were desirable goals. However, the basis for uniformity was a product of decision-making within the training system, rather than from without. 'As the content was fixed by curriculum (department), all students did the same subject. Therefore, industry input did not change this process'.

However, the internal focus on decision-making was not always receptive to the demands of external sources. 'Sometimes (there were) tensions between what teachers had been asked to teach and needs of local enterprises. Moreover, local industry representatives felt that their views were not heeded in a highly centralised and provider-driven approach to curriculum. Concern about this centralised approach was

expressed by an employer who stated that, 'That curriculum committee made some recommendations that were not taken into account when the process was finished. I remember feeling at the time that it was a waste of time'.

The comments from other respondents support the view above about a centralised provision, based within the TAFE system. The curriculum officer at that time stated, 'I wrote curriculum documents within State office … co-ordinated different curriculum development committees around the State' and another industry representative noted their role in the 'development of national core curriculum'. There was some evidence of course development being undertaken in the metals sector outside of the system. However, these were in workplace-based non-trade courses.

There was, however, industry input through the TAFE system. 'Industry had a lot of input back then ... any curricula that were developed, were developed in association with industry by arranging representation'. However, 'TAFE owned the curricula because they were the responsible agency and none of the curricula I have been associated with were ever released without industry involvement and approval'. Other less formal interactions were reported by enterprise respondents such as consultancies with industry, industry-based students, part-time teachers from industry, and teachers working part-time in industry. '(H)owever, it was still pretty much provider driven'. These views are supported by teachers' claiming that much of the contact was informal, based on teachers' conscientiousness. So it seems that, prior to the broad-based implementation of CBT, the metals provision in Queensland was guided by an education system-based provision.

Hospitality in Queensland

In contrast, the hospitality teachers' roles, their autonomy and the curriculum development processes represent a view of curriculum development best characterised as college-based. However, their work was guided by some national documents (red book, black book, green book). Teachers stated that, 'I developed programs', 'Little was developed in hospitality', 'TAFE started going out and soliciting people like myself who had worked in different systems to put together new training programs'. Perhaps capturing the difference between sectors, one respondent stated that 'hospitality in Australia never had the tradition behind it as it does in Europe, so there was very little industry input at that stage. Moreover, 'hospitality wasn't seen as a real industry as it was in Europe'. This, in comparison to the metals industry where input by teachers was permitted and valued 'developed and delivered some training programs for a large hotel in Rocky', 'I was responsible for the design of curriculum'.

At this time, it seems hospitality teachers' practice was not bound to their syllabuses. It was stated that 'teachers were given the subject topics and were allowed to develop their own lessons. Syllabuses were not very structured and teachers could follow their biases (e.g. one teacher spent 80% of a commodities subject just on eggs). 'Training providers dominated training'; it was the providers that determined what was available to industry. 'There was virtually no input from industry at this stage. Our curriculum was much vaguer and we had sole control over its contents'. However, others suggest that it was influenced to a certain degree by industry because of the consultative processes within industry, but it was more a matter of 'we produce the syllabus for Queensland, here we are industry what do you think of that? … They endorsed the syllabus but didn't have that much input into it'. Others concurred that 'Curriculum (was) TAFE driven, although the perception was given that industry had a large part to play.

Hospitality in Victoria

Teachers in the hospitality sector in Victoria also played a key role in the development of syllabus—the intended curriculum. 'We were in groups of subject specialists and that was from all TAFE colleges and we sat down together and thrashed out some ideas and there was a spokesperson for each table and we mapped it out that way'. The officer who had responsibility for hospitality studies confirmed this view. 'My role in curriculum was first of all to document the material and obviously you had to have subject expertise there so the teachers would be involved in inputting data and determining appropriate assessment methods etc. But they would be a selective few and my role then, having got the material up and accredited, was to then provide professional development in the system to teachers on the floor to implement it'. At this time, industry influence upon curriculum decision-making was through a number of formal and informal avenues. There was a formal industry advisory process, although its membership and influence were subject to views from within TAFE. 'Well it (advice) was usually through an industry advisory group, and depending on how well selected ... it may or may not influence what was in the curriculum'. These groups were 'usually [organised by] the Head of Department or Assistant Director who knew people in the industry and just nominated them. It was a network system'. There was also representation on college councils, 'pre-CBT, (there were) fewer providers, therefore closer ties to college councils. William Angliss was the only provider up to 1983. Industry dealt with only one provider. Industry had representation on council. In 1980, Cook's committee (was) developed'.

So these formal mechanisms were the means by which industry could influence curriculum decision-making. However, the focus of and organisation of these forums were under the auspices and control of TAFE. Teachers' informal contacts also played a role in reflecting industry needs in the curriculum development. 'TAFE teachers in the hospitality/tourism sector were always employed with industry experience/background. Lots of liaison used to occur, (through) moonlighting in industry'. Therefore, as with the experiences above, the hospitality provision seemed to be college-based, albeit with the provision of documentation provided at the State level, which itself was partially a product of input from selected teachers.

Metals in Victoria

It seems that prior to 1989, the metals industry sector in Victoria had a tradition of a centrally based curriculum provision that furnished modular materials to the TAFE colleges. Nevertheless, as noted above, some teachers reported having a high degree of autonomy, whereas others felt constrained to be faithful to what was stated in the syllabus. 'My initial role as teacher was not influenced by industry. Industry influence increased with the advent of new political processes of education. Areas outside fitting and machining, such as construction, industry training had large industry input'. There was industry influence on curriculum provisions, however it seems that it made requests of the curriculum provision within the TAFE system rather than directed the provision. '... Before it was external (State Training Board) and after National Metals and Engineering Curriculum (NMEC), 'Industry requested certain modules to complement their training of apprentices/trainees', 'needs of industry did not necessarily reflect needs of TAFE department'. Later, this relationship changed. 'Because the change to CBT was related to the award restructure and in the metal industry, TAFE and industry have had to develop a partnership approach'. 'Industry wanted to restructure and abolish some demarcation. Also, they wanted more specialisation in their industry'.

In sum, the introduction of CBT brought with it a nationally uniform means of developing and organising curriculum documentation—the intended curriculum.

However, prior to its implementation, different bases for curriculum decision-making and organisation were being used in both sectors. It seems that in both Victoria and Queensland that the provisions of curriculum documentation and associated procedures for the metals industry were centralised within the training system. Hospitality, on the other hand, seemed to be guided much more by college-based curriculum provisions. Under the CBT movement, that circumstance was to change to one centralised outside of the training system under the auspices of industry advice.

Influences on teaching practice prior to CBT

In order to understand further the antecedent conditions associated with curriculum decision-making, teachers were asked, 'To what degree did you enjoy freedom in what was taught and how it was taught' (AI10). The concern here is to identify who or what influenced their teaching practice. (This question is compared later to one that presents data on curriculum decision-making once CBT was implemented.) The responses to the first question are presented in table 4.2 (appendix 2). Some of the strongest statements come from hospitality teachers in Queensland, who reported high levels of autonomy in determining what and how they taught. Hospitality teachers stated the following: '(the) teacher was king in such a climate we had total freedom; basically you and your team determined what and how it was to be taught; areas to be taught were often interpreted differently by different teachers, but interpreted differently by individuals based on own experiences; enormous degree of freedom'. However, some metals teachers provided similar comments, for example, 'Never felt bound by one delivery strategy and I saw the syllabus as a minimum, total freedom as far as I was concerned'.

The responses indicating an involvement with 'senior teachers and peers' was consistent across the two sectors. However, the subjects reporting that combinations of teachers, senior teachers and centralised bodies (e.g. curriculum branch) involvement were more likely in the metals sector. There is a patterning in the responses indicating that at this level of decision-making, Hospitality teachers were more likely to experience greater autonomy than their metals counterparts. There are good reasons for this circumstance. Firstly, the metals courses are regulated trade courses. 'In a licensed trade it was necessary to maintain close contact with industry'. Secondly, the metals courses had a long tradition within TAFE, unlike hospitality. So again, there is evidence of different antecedent conditions. Again, these differences appear to be cross-sectoral rather than State-based as identified above. It is also noteworthy that criticisms voiced by external interests, saying that teachers had too much autonomy are also being voiced by some of the teachers, in administrative roles.

Responsiveness to the syllabus

Continuing the task of identifying antecedent conditions associated with curriculum decision-making, the teachers were asked 'To what degree were you responsive to syllabus requirements'. (AI11) The concern here is to understand in more detail the decision-making process (and later for these data to be used to provide pre and post comparisons). This particular item refers to the role of syllabus in the curriculum process. As proposed in chapter 2, much of the effort to secure a uniform curriculum provision in VET was through national curriculum documents containing nationally agreed outcomes. These outcomes were aligned to national competency standards. The syllabus was the manifestation of national standards and national curriculum deliberations—the intended curriculum. Consequently, data about how teachers used the syllabus prior to and after the implementation of CBT aims to furnish indications of whether syllabus use is likely to achieve the intended outcomes. A summary of the responses is presented in table 4.4 (appendix 2).

The data indicates that prior to CBT, the syllabus was not uniformly seen as a guide to be followed faithfully by teachers. Some teachers claimed to have adhered faithfully to the syllabus stating the need to adhere to guidelines because of educational audits, inexperience and other concerns. The syllabus as a guide was a common motif. Rather than determining practice, it was adopted typically by these teachers as something with which they could be discretionary. The responses here seem to be balanced across States and sectors.

Antecedent conditions in overview

In overview, there were different antecedent conditions across both the States and industry sectors. The overview which follows presents the differences in two sections; the first discussing the prior knowledge of CBT and the second, the organisation of curriculum.

Prior knowledge of CBT

Different antecedent conditions existed between States and sectors in the prior knowledge of CBT by teachers. The Victorian teachers reported being far more knowledgeable of CBT. LessVictorian teachers claimed they knew nothing of CBT, than their Queensland counterparts. The responses from the Victorian metals teachers, in particular, indicated a greater knowledge of the implementation of CBT and were based on their knowledge about its implementation. So prior to its implementation, it seems that Victorians were more knowledgeable, in particular, about the goals and processes of CBT than in Queensland. Also teachers in the metals sector seemed more knowledgeable than those in the hospitality sector. This finding can be explained, at least in part, by there being a curriculum and instructional model (the Instructional Systems Model) which was introduced into the trade areas in Victoria in the early 1980s (Mealyea 1985). This system is analogous to what comprises the current provision of CBT (e.g. modularised, resource-based curriculum provisions and a more learner-focussed approach to instruction). It seems that the metals sector in Queensland was more closely aligned to central prescriptions. Also, this sector in both States led the introduction of CBT. As a result, awareness programs (e.g. 'Training Restructured') were very much targeted at the metals sector. The knowledge of CBT, prior to its implementation, was not uniform across States and sectors. Knowledge varied from claims of no knowledge at all, to those who had engaged in a provision of VET, which was quite similar to what was ultimately implemented nationally. Indeed, the emphasis on self-pacing which was a part of the Victorian trade provision has never been fully endorsed by all State governments or the federal government as an integral part of CBT. Rather, where self-pacing has occurred it is more likely driven by resource-based factors and, in particular, beliefs about the cost-effectiveness of resource-based provisions.

As stated above, the importance of differences in knowledge about CBT are at least fourfold. Firstly, quite different bases of knowledge existed prior to its implementation. These differences encompassed ignorance of the initiative to those who had had experience with implementing a similar system. Secondly, the 'top-down' means of organising curriculum was perhaps more familiar in the metals sector than in hospitality. Thirdly, most of the initial trials and professional development support and materials were directed at the metals sectors and its teachers. Their needs may have been quite different from those in other sectors. Fourthly, assumptions that uniformity of provisions could be realised by edict seem quite naive given the differences in teachers' readiness for this initiative.

Organisation of curriculum

In Queensland, prior to the uniform introduction of CBT, the vocational education provisions for the metals industry were organised from within the State's training system. There was a central curriculum branch within the TAFE system, based in Brisbane that furnished syllabus documents. An examinations section distributed centrally developed and prescribed examinations to the State's TAFE colleges. In addition, there was also a section in Brisbane that allocated apprentices to colleges round the State. Therefore, much of the decision-making within the metals sector was centralised and top-down within the State's training system. In contrast, it seems that although some national documentation existed for the hospitality industry, there was less centralised prescription and teachers enjoyed greater discretion in designing their own programs and assessment. The hospitality teachers' work in both Victoria and Queensland could be characterised as being college-based, whereas the metals teachers' work was more system-based. As noted above, in Victoria, trade courses were based on a system, which was analogous to CBT known as the Instructional Systems Model.

In overview, there were differences in the antecedent conditions of the two sectors in Victoria and Queensland. These differences are explainable by the different stages of development and profile of the two sectors, not the least that the metals industry largely focussed on legislated trade training procedures. The metals trades had historically played an important role in the vocational education system, whereas at that time, the hospitality industry was emerging as one to which the publicly funded provision of vocational education was being extended. The important outcome of these different pathways of development was that teachers' roles, the source of curriculum documentation and materials were quite different across the two industry sectors.

So there were differences in the determination of curriculum decisions about courses and differences in the autonomy of the teachers in implementing curriculum (e.g. metals teachers guided by external notes and ISM, the hospitality teachers using materials they had developed themselves or in expert groups to implement locally). This meant that teachers in each of the sectors had different roles prior to the advent of CBT. Taking Marland's (1978) categories of teacher roles, it seems that in hospitality, teachers were more likely to be engaged in roles as researchers and developers, than their counterparts in metals (see table 4.5 [appendix 2]). These differences can be partially explained by the courses offered in metals being regulated trade courses and hospitality being an emerging area of interest that, although having a regulated trade (professional cookery), did not have the same degree of imposed centralised structures. However, consistent across both sectors was that the bulk of decision-making was being undertaken within the TAFE system (teachers in hospitality, State system in metals), rather than by industry. Informal links and newly appointed staff were stated as the means by which the industry voice was being articulated. Industry spokespersons noted that that industry influence was being enacted through decisions about the contents of curriculum documentation, particularly syllabus—the intended curriculum. However, as suggested above, not all teachers were closely guided by these documents.

From these different bases, the next section outlines how and in what ways the introduction of CBT and its associated administrative arrangements (national curriculum documentation, accreditation and assessment frameworks) transformed arrangements for the intended curriculum in both sectors, thereby attempting to render them more uniform. It was intended that the transformation was to be towards a greater emphasis on decision-making external to the vocational education system and colleges. The question is to what degree was this realised.

Curriculum provisions after CBT implementation

This section draws upon data that inform about in what ways curriculum provisions were changed by the implementation of CBT. The components of this section are:

- changes to teachers' activities as a result of the implementation of CBT
- the responsiveness of teachers to the CBT syllabus and other priorities
- the transformation of teachers' practice
- the impact of the accreditation processes on teachers' work

Through an analysis of data that addresses these issues it is proposed to understand more about the way that CBT has transformed teachers' roles in the development and implementation of curriculum. The influences on the curriculum and teachers' activities, prior to the implementation of CBT set out above are used here as a basis for comparisons.

Changes to teachers' activities

In the focus groups, teachers were asked to respond to a list of teacher activities. This list was taken from documentation about teacher's roles as set out in a registration document. Teachers were asked to indicate whether these activities had changed prior to and after the implementation of CBT and also what was the change. Table 4.5 (appendix 2) lists these teacher activities and the subjects' response. The activities are presented in the left-hand column. In the two columns to the right are responses indicating whether these activities were part of regular practice prior to and since the implementation of CBT. In the right hand column, the reasons for any differences in activities are presented. The activities are: Determining content for course; Lesson planning; Feedback to students; Individualising learning; Group work; Program Planning; Promoting independent learning; Keeping student records; Finding time to assess students' work; Reviewing curriculum; Monitoring learners' progress; Managing the learning environment; Monitoring and evaluating performance; Promoting students' acceptance of responsibility; and Involving students in self-evaluation.

The following are brief descriptions and discussions of the responses to these activities.

Determining content for course

Almost unanimously those suggesting changes stated that there was less involvement with determining course content after CBT's implementation than had been the case. The exception was a subject who noted the greater demands brought about by individualising the curriculum. Those noting reduced involvement by teachers referred to a more restrictive provision, lack of control, concerns about audits, prescribed by national bodies. Of those who said there was no change, the largest groups were Victorian metals teachers (5), and Victorian hospitality teachers (4).

Lesson planning

Of those who provided examples of changes in lesson planning, most claimed less was required (8) whereas two teachers stated more was required to manage individual students' programs. All those stating there was change were from the metals sector. The responses about changes to lesson planning are of two kinds. References are made to national external modules whereas, the others refer to self-pacing and the individualised nature of curriculum in metals. Depending on the perspective, individualised and self-paced curriculum arrangements have been claimed to replace formal lessons and hence their planning, or, conversely, require a higher degree of planning. The key impact on planning in the metals sector seems to be a product of individualised and self-paced

instruction. Those stating there was 'no change' were from both sectors and States, with hospitality being represented slightly more frequently.

Feedback to students

More responses indicated increases in the amount of feedback to students than those indicating it had reduced. Those stating there was a reduced requirement referred to non-graded assessment, and that students' work has become more independent. These responses were from both sectors. Those claiming feedback has increased referred to enhanced administrative requirements for assessment, more supplementary assessments, different levels of students' needs to be met and students' awareness of the right to receive detailed feedback. These subjects were wholly from the metals sector. Those claiming there to be no change were representative of both sectors and States. Overall, the evidence suggests that there has been an increase in the demand for feedback to students, which has had most impact in the metals sector. These changes are associated with administrative concerns as much as educational requirements. Indeed, the only reference to student involvement is to accommodate their growing expectation for feedback on their progress.

Individualising learning

Unanimously, those who stated there had been changes proposed that much more individualised learning was occurring after CBT, than before. The activities involved in this change included monitoring student progress, more students, self-paced programs and the need to meet student needs. Subjects claiming these changes were more likely to be from the metals sector than hospitality. Those who claimed 'no change' were representative of both sectors and States. Consequently, there is some evidence of an increase in individualised learning that resulted in enhanced monitoring, working with more students and individualised programs for some teachers.

Group work

It was claimed that either there was no change or the change had been to reduce the amount of group work. Those claiming 'no change' were representative of both sectors and States. However, those claiming changes were mainly from the Victorian metals sector, almost universally stating that the shift to individualised instruction had reduced opportunities for group activities.

Program planning

Almost universally, those reporting changes stated reduced teacher involvement in program planning. This was held as being the product of a lack of flexibility in industry determined programs and more difficult because of individualised and self-paced learning programs. These responses were representative of both States and sectors. Conversely, one subject claimed meeting enterprise needs meant more program planning.

Promoting independent learning

Most subjects claimed that there was little in the way of opportunities to promote independent learning which seems curious given the references elsewhere to self-directed learning. These responses were representative of both States and sectors. Those who claimed changes had occurred predominantly stated that more opportunities were now available. The sources of those opportunities were founded in independent study (e.g. research), additional monitoring, and access to materials for students to work with, the provision of individual pathways for learning, and the use of self-paced instruction. Again, these responses were representative of both sectors and States, although Victorian metals were most strongly represented.

Keeping student records

Most commonly it was claimed that no change had occurred in the keeping of student records. Those supporting this view were broadly representative. However, there were those claiming quite strongly that additional demands were demanded here. In particular, it was claimed that the requirements for recording and record keeping associated with student performance and their maintenance had become onerous. It was mainly metals teachers who expressed concern about additional record keeping activities. One subject stated that electronic aids had eased this task.

Finding time to assess students' work

The most common view across both sectors and States was that finding time for this activity had not changed, it was the same prior to and after CBT's implementation. Those who claimed changes noted an increase in the demand of assessment activities, an increased variety of assessment tasks and enhanced assessment-related administrative activities. Given other demands, the limits of time were also reported. The respondents were representative of both sectors and States. So where there was reported change in managing to find time to assess students' work, the demands of assessment and administrative tasks were noted.

Reviewing curriculum

The responses to reviewing curriculum were reported commonly as being the same. However, some claimed that they had not been involved before and were not now. Of those who stated a change had occurred it was that they were less involved now than prior to the implementation of CBT. The reasons advanced for the reduced involvement included an exclusion of teachers, lack of local content and a focus on 'user-pays'.

Monitoring learners' progress

The most common view across both sectors and States was that there was no change in the monitoring of learners' progress. It was the same prior to and after CBT's implementation. Those who dissented stated commonly that this activity had become more intense. Noting the requirements of audits, monitoring students' completion of all learning outcomes, and the focus on these outcomes, these subjects stated that monitoring students' activity had become more demanding. For these subjects, monitoring student performance was unanimously associated with outcomes, rather than their progress towards outcomes.

Managing the learning environment

In response to changes to managing the learning environment, the common view across both sectors and States was that the demands of this activity had not changed. It was the same prior to and after CBT's implementation. Of the four views dissenting, two proposed that a lack of resources inhibits this activity.

Monitoring and evaluating performance

The most common view across both sectors and States was that this activity had not changed, it was the same prior to and after the implementation of CBT. These respondents were representatives of both sectors and States. Only four subjects dissented from the common view. They all stated that there was more required in the monitoring of student performance now, with the demands of audits and adherence to national prescription.

Promoting students' acceptance of responsibility

The responses to this activity were quite diverse. A number of subjects claimed no changes had occurred in arrangements for promoting students' acceptance of their

responsibility. These respondents were representatives of both sectors and States. However, there were contradictory views with some claiming that these activities had increased while others suggested they had decreased. Those claiming more opportunities were now available stated that there was less teacher availability, flexibility with what students learn, when they are assessed, and availability of resources which students can engage with independently. These concerns are focussed on opportunities for learning processes. Conversely, there are views stating that multiple opportunities for assessment reduces student responsibility. Another view questions the goals of educational processes under CBT stating that there is more difficulty questioning content relevance. So, the issues of increasing students' acceptance of responsibility are one of the few areas of considerable divergence of views.

Involving students in self-evaluation

The common view, across both sectors and States, is that involving students in self-evaluation has not changed. These respondents were representatives of both sectors and States. Views claiming there have been changes are again divided, although most respondents claim that more opportunities are now available. These views relate to student control over the assessment process. Those views questioning increased opportunities suggest that the very basis of CBT assessment inhibits students' self-evaluation as the goals for what and how they are to learn are established elsewhere by others.

Changes to teachers' practice

Overall, there was reported continuity in many of the teachers' activities prior to and since the implementation of CBT. However, there were changes. In overview, the data in table 4.6 (appendix 2) suggest that there was some consistency across sectors and also inconsistency. Across the sectors were the following:

i) Changes in 'Determining content for course' were viewed consistently across both sectors as being less a part of teachers' work after CBT's implementation than before.

ii) Change to 'Individualising learning' was seen to be a shift to a more individualised focus for curriculum arrangements, which eroded opportunities for group activities in some ways and made greater demands upon teachers.

iii) Changes to 'Program planning' were almost universally seen to be associated with reduced teacher involvement and an increased emphasis on externally determined programs.

iv) Changes to 'Group work' were seen as a shift from group activities towards individual activities. These changes comprised a shift to individual pathways of learning, self-paced approaches to learning, customised programs, and resource-based approaches to instruction.

v) Commonly it was claimed there was no change to 'Finding time to assess students' work', although some claimed that other activities encroached on this time. 'Monitoring and evaluating performance' was also commonly viewed as not having changed post-CBT.

vi) 'Reviewing the curriculum' was commonly held to be an activity where change resulted in less involvement. However, it was proposed quite widely that there was little involvement prior to CBT.

vii) 'Keeping student records' was viewed consistently across both sectors as now being more demanding.

viii) Monitoring learners' was commonly reported across both sectors as not having changed.

ix) 'Promoting independent learning' was commonly reported not to have changed. Those claiming it had, were metals teachers.

x) Changes to 'Lesson planning' were reported as having a greater impact upon the metals sector with more work required to accommodate individualised instruction.

xi) 'Feedback to students' was seen to have increased as reported by the hospitality teachers, but even more so by metals teachers.

Overall, there is evidence of both continuity and change. Not all teachers' activities have been wholly transformed by the implementation of CBT. In particular, *Promoting independent learning, Keeping student records, Finding time to assess students' work, Reviewing the curriculum, Monitoring learners' progress, Managing the learning environment, Monitoring and evaluating performance and Involving students in self-evaluation* are reported not to have been transformed. Where changes have occurred it is associated with more *Individualised learning*, a reduction in opportunities for *Group activities*, a reduction in teacher involvement in *Determining content* and *Planning vocational education programs*, and promoting *Students' acceptance of responsibility*. Increases in teachers' work have been associated with administrative tasks associated with Assessment and Monitoring activities.

The analysis here suggests that in keeping with narrowing of their roles, that teachers' work has become more focussed upon being implementers and adapters to use Marland's typology. It seems that roles associated with being Developers and Researchers are the ones that have been most weakened. The question remains as to what degree this is a mere change in teachers' roles as brought about by changes in institutional arrangements (Seddon 1997) or a more fundamental change. However, now new changes are occurring within VET that may once again see teachers engaging in a wider range of roles. This refers to the shift to enterprise-based arrangements, which is now pressing teachers to customise curriculum to the needs of local enterprises. In particular, the advent of the Training Packages is seeing a shift in that direction (Billett & Hayes 1998). So this change may well see the latest in the transformations in the professional roles of educators as Seddon (1997) suggests.

Also, in examining the factors that have brought about change in teachers' practice, they seem to be most closely associated with external arrangements; those that have a public aspect (e.g. being responsive to demands for accreditation requirements and changes to assessment practices.) Hence, those practices that demand attention to an external audience are those that the data suggest have been most transformed. This seems to suggest that teachers as autonomous practitioners have residual abilities to resist unwelcome changes. That is particularly the case when these practices are conducted in the privacy of the teachers' classroom. This of course is a two-way street. However, it reinforces the naivety that teachers' practice can be changed by external mandation alone.

Responsiveness to CBT syllabus and priorities

To gain further insights into changes brought about by the implementation of CBT, the teachers were asked about how changes in curriculum organisation affected their work. This was done in two ways. Firstly, teachers in the Focus groups were asked to respond to a Likert scale indicating 'To what degree they were currently compelled to be responsive to syllabus requirements'. Also they were asked 'Are there differences between pre- and post-CBT priorities?' (PC2). Responses are presented in table 4.7 (appendix 2). Below, the findings from this table are discussed. These augment the data from the industry interviews and teacher histories that are reported below this table.

In overview, reasons why subjects stated they needed to follow the syllabus 'faithfully' were associated with:

- accountability measures including concerns about auditing;
- the articulation of clear learning outcomes in the documentation; and
- to meet the requirements of the range of available subjects.

The responses claiming to be 'guided by it sometimes' are associated with:

- a lack of resources to adhere faithfully
- concerns about the quality of educational provisions with the curriculum provisions
- concerns about accountability and auditing

One subject claimed that they 'considered the syllabus occasionally' and two subjects that 'nothing had changed'. Overall, the responses indicate that concerns about adherence to the syllabus are premised mainly on concerns to meet learning outcomes and about being audited.

When compared with table 4.3, it seems that for these subjects there is, overall, no greater commitment to following the syllabus with fidelity than prior to the introduction of CBT. What has changed are the reasons why these teachers' practice is claimed to be influenced by the syllabus. These reasons are associated with accountability. This was a goal of the reform process. Two issues however, seem to arise here. Firstly, the reasons for focussing on the syllabus are not wholly associated with educational outcomes. They are about administrative procedures and practices and adherence to external demands about learning. Secondly, further data might inform about the degree to which claims about adherence to the syllabus are related to other matters associated with processes and outcomes.

Data were also gathered from interviews with industry and enterprise representatives, and through the teacher histories. Teachers were also asked, 'What changed the ways training needs were established in your industry? (PN1).

Hospitality in Queensland

Changes in the hospitality sector focussed on both the implementation of curriculum—the enacted curriculum—and the intended curriculum.

There was reported a shift towards greater uniformity in what was to be implemented. According to one teacher, 'We were all teaching the same thing in different ways. CBT was a vehicle for standardisation, at least early on'. So there were changes in what was taught and the outcomes for students' learning. One of the contentious things during the implementation of CBT was the use of the term 'to industry standards' as an outcome. According to an industry representative, this led to confusion about these standards that were to be the basis for teaching and assessment. (i.e. 'what the hell are industry standards? I mean, are you talking about the [major hotel chains] or who?') This problem was seen as being difficult to resolve, which is not surprising as the notion of industry is abstracted from actual practice. However, for others, things didn't change dramatically. 'It still hasn't changed. I get the feeling that when new documents come out they're just massaging—changing names. I see people still teaching the same material they always have. What did change was the way we assessed'. This is consistent with what was proposed above. Also, the issue of heightened expectations of students is also raised here, 'Having to communicate more and explain decisions that were not popular. Students wanted to know what they had achieved'.

There was a national focus on determining training needs. 'They did a training needs survey on every possible skill needed within hospitality. That was used as a basis for

virtually everything. If you look at the one for cooking it got down to the skill of collecting and killing fish. A part of the needs analysis was a survey of exactly how many establishments actually carried out this particular skill. It was a massive survey and it was used for almost 8-10 years and was used as the basis for competency standards'. This survey denotes a change from the prior circumstance where the teachers claimed to be the key source of curriculum intent to the use of a national audit. This change in emphasis marks a clear shift from the college-based approach of the past.

The reason for making this change from the college-based approach was seen as a 'searching for means of getting a more standard product from all colleges'. It was seen as an approach to manage the TAFE system with 'CBT introduced to achieve this rather than the use of inspectors'. Concerns about the basis for changing the intent and content of curriculum were also raised by the subject who had responsibility for its State-wide implementation. 'There was a lot of mistrust. The training was identified by industry perceptions. Prior to CBT there was massive criticism of TAFE, but when CBT came in they started to say "we want TAFE to do the assessment because they're the only ones that haven't got an axe to grind. Why should I take assessment from that bloke down the road?" However, it has been proposed that as a result of these changes closer relationships developed between industry and providers'.

From an employer perspective, there were significant changes. These referred to the experienced curriculum for the learners, that is reduced time in college-based experiences, and assessment being undertaken in the workplace. 'The big change is really the fact that you don't have to send them off to college with your workplace-based assessment. For your smaller businesses you can't really afford to have your apprentices away for their blocks ... That flexibility has made a large difference. If your apprentices show ability they are not required to be away for such a long period of time. Our apprentices are formally assessed on-site by TAFE trainers'.

Hospitality in Victoria

In Victoria it seems as though the transformation was not as great as in Queensland, although the same concerns about assessment and outcomes were raised as issues. A teacher commented 'I think a lot of people thought that we were competency based anyway, particularly for the practical stuff. I think for those people who were teaching theory subjects, that they weren't too sure of how to formulate it into competency-based assessment, whereas a practical subject is very easy to perform a competency-based task. I always thought that a practical subject was competency based, anyhow, because of the nature of the actual subject. I had my own desired outcome sheet, but that required a certain outcome that students had to achieve before they could pass the subject'. The demands of other initiatives were being experienced by teachers simultaneously, '... at the same time as we were introducing this new curriculum we were moving towards open access, flexible delivery approach—similar to what the skills supermarket in Richmond were running. Therefore, the teachers had to be advised on how they could arrange their studies and timetable to accommodate people enrolling at any time. And going through them being assessed...'.

The influence of external sources of curriculum content and intent were also evident. '... The main change was that industry now had a much bigger say in what should be done, what should be in there, everywhere in fact—at any stage of the event, ... so I think the major change has been the link for people such as myself to ensure that the key power-brokers in the industry have input to any curriculum development work and then in interpretation. By negotiating through ITABs we get representative people on those project development committees'.

Continuing, the curriculum officer for hospitality suggested that the basis for curriculum intents and content changed, as did teachers' involvement in their identification and selection. 'Well, what has changed is now that the industry training board—we are talking national now—have to set national competency standards, these effectively would encase what we would have done in a DACUM (technique for developing a curriculum) session or job analysis before. So our entire curriculum was based on these competency standards and the only time we would get involved in developing those is where there are no national competency standards to be used. We are not involved at all. We have become the receivers of the base on which curriculum is built, rather than the receivers of curriculum. We are not involved in developing standards at all. So that bit's been removed from us. The only time we get involved in doing that is when it is local standards or community standards'.

What is proposed here for the hospitality sector characterises much of what was presented earlier; that little changed in teachers' practice apart from those practices that were externally mandated. In particular, there has been a shift from a college-based curriculum provision to one that is determined by deliberations that are external to the colleges and the TAFE system. Teachers and providers of vocational education became 'receivers' of what was developed elsewhere. One consequence of this change was that the focus of what was taught and outcomes were not always clear. Changes to assessment, including justifying non-graded assessment to students also seemed to be influencing curriculum decision-making. The point here is that the intended curriculum was influential insofar as it mandated particular kinds of responses, (e.g. assessment practices, and adherence to standards, having to explain mandated assessment practices). However, much of what was implemented remained the same, except again where external demands intruded in particular ways.

Metals (Queensland)

From Queensland teachers' perspective, in the metals sector change occurred but not all aspects of teachers' practice were transformed. It was 'all the same, except that under CBT there are many more tries for assessment for each of the learning outcomes', 'same pre and post, except the depth of record keeping, assessment items and involvement in evaluation has been much greater since CBT. And, for what? In most cases to satisfy the auditing requirements which really have very little to do with education and training' 'modularisation, and uncertainty with assessment practices (what, when and how) changed what teachers practice'. It was also suggested by a teacher respondent, who has administrative responsibilities that students also did not necessarily welcome the introduction of CBT, 'a greater number of students didn't want or had the ability to take on this form of learning'. So, teachers in the metals sector identified the consistent theme about an increased emphasis on assessment and other activities associated with accountability.

The shift in relationships from industry getting what the training system wanted, to what 'industry' wanted, as well as the quality of that relationship are evident in the comments of an industry representative. 'Industry peak bodies were the ones who made CBT curriculum, the national standards. Training personnel were just told what to do with it once it had been done, so there was very little relationship between industry and providers at that stage'. This view reinforces the idea of teachers as 'implementers' of curriculum developed elsewhere and by others.

However, it seems as reported elsewhere that relationships between providers and enterprises have changed since the introduction of CBT. For example, an enterprise respondent states, 'We now have more contact with the college teachers. They now bring students down here and I show them through the place. Lads come down here for work experience; that never happened before CBT. I have a fair bit more contact

with the college teachers. They come out and talk to me a lot more; following up on kids on work experience or whatever'. Also, capturing both the shift in the metals sector from a system-driven curriculum response, to one which is responsive to industry and now involves greater interaction with enterprises, the following is proposed. 'TAFE's role in curriculum development process declined, the loss of curriculum department, shift from the centre and a rise in the role of ITABs. However, some functions still involve TAFE because ITABs lack expertise'.

Key changes away from the previous focus on a TAFE system-led metal provision are also evident. Firstly, curriculum provisions were able to respond to local needs and 'focussed on the requirements of a local major infrastructure development and the enterprises that contracted to that development'. Secondly, according to an industry informant, education provisions '... responded to changes in industrial relations (award restructuring) reduction of classifications—new courses were developed to respond to changes in industrial agreements and efforts to make them more responsive to industry. Thirdly, the rising influence of the ITABs was evident in the intended curriculum. 'The metals and engineering industry developed an ITAB ... which drove the changes that were subsequently to happen because of CBT ... They told us we had to get all our programs 'modularised' into competency based. We didn't consult anybody other than the peak industry bodies, who looked at all the curricula around Australia and found the common elements in it and then made that the standard'. So, in these ways there was a shift from a focus on decision-making within the TAFE system to the system being increasingly influenced by 'industry' and also local enterprises.

So the key changes with metals were modularisation, assessment and relationships with enterprises and industry. However, as mentioned above, the implementation of CBT in Victoria also coincided with the introduction of a broadening base of self-paced delivery. To some this meant there was no change, whereas for another, 'The main impact was the implementation of self-paced delivery and rolling enrolments'. However, the task of addressing the goal of meeting directly enterprises' needs, is beyond the resources of the TAFE system. As an industry informant stated:

> *What CBT didn't address, and it was supposed to, was the fact that the curriculum was supposed to be in line with on-the-job training. Now that's impossible. I don't care what system you put in place, you cannot design a curriculum that allows a client to do a universal joint today—it would be tedious—the environment today here and then go out on the job and do the same sort of thing. The employer may not have that. So there was very little alignment between that and the CBT delivery. That was a real downer for it, because we didn't work, we had this great way to tell the employer what we should be doing, instead of saying to the employer, 'look, what do you really want; he's your apprentice, he's not mine'. I would argue that it hasn't changed and it purely hasn't changed because nobody that I know of within the TAFE system, and we are not funded for it, has the capacity to go out to industry and say, what do you actually do in a workshop, when do you do it, how do you do it, what are structures, and then can we do this in conjunction with you? It just doesn't.*

Impact of the accreditation processes

One of the initiatives most associated with the introduction of CBT was the establishment of a common accreditation process across the States and Territories. Rather than convince those involved in vocational education of the merits of CBT, measures were adopted under NFROT; effectively mandating the implementation of CBT. Put simply, if the course documentation did not explicitly embrace CBT and its associated baggage (RPL, modularised units, and adherence to industry standards) the course would not be formally recognised in the State or Territory. This meant no funding to offer the course, no recognised certification could be awarded and no

government endorsement. Consequently, for courses to be offered, all State and Territory governments, under an agreement with the federal government, mandated courses to be in a CBT format. An associated process, registration, was used to determine if the providers had the resources and would adhere to the requirements for CBT format set out in the accreditation documents. As with the use of uniform and detailed syllabuses, these processes were held to be bureaucratic measures to manage the implementation of a uniform provision of CBT.

To determine the consequences of the use of accreditation procedures, the teachers and industry representatives were asked about the effect of accreditation on curriculum practice. How did the processes of accreditation change your work? (PC3) (table 4.7 [appendix 2]) reports the main changes experienced by those involved in vocational education provisions as: the reporting activities, the registration procedures, the influence upon teaching practice, the need for professional development, influence upon job satisfaction and those proposing no change had occurred. In more detail, the data pertaining to each category are as follows.

Reporting activities

The data reporting activities include reference to record keeping, monitoring and validating what has been done. Some saw this as purely an administrative task (teachers). CBT was seen also as improving the educational provision and making the system more responsive (enterprises). There seems to be little difference across the sectors or States, except that it was referred to more in Queensland than Victoria. From the teachers' perspective, these tasks were identified largely as being associated with accountability to external demands and of a kind not previously required. It indicated the external demands for the goals and means of vocational education programs to conform to set requirements that includes the implementation of associated curriculum initiatives (e.g. RPL, cross accreditation, assessment practices). These activities were perceived to be means to become responsive and maintain responsiveness to industry requirements, by both teachers and industry respondents. The question is whether such activities enhanced the quality of educational provisions.

Registration process

This process was viewed as a mainly unwelcome requirement to demonstrate credentials to teach and have the resources to do so as stipulated. Profiles of teachers, their qualifications and experiences, the infrastructure required for student experiences were at the centre of these requirements. Clearly, this was a challenge for a number of teachers and an administrative task for others. Much of this requirement arose from the broadening of the training market. For example, in Queensland, TAFE colleges were initially exempt from this process. However, with the advent of an open training system, they were required to comply. The concerns here were represented evenly across States and sectors. So, whereas the accreditation process made demands about the curriculum processes to be adopted and maintained by those offering the courses, the registration process was about measures indicating an ability to provide the course as intended. So the key activities being subject to question were administrative tasks, and those associated with individuals' credentials to teach. The key consequence of this second concern can be found in the data below about professional development.

Teaching practice

Issues about the impact of the accreditation process on teaching are almost wholly negative. Those in the metals sector in both States in particular advanced these issues. These changes extended to fundamental aspects of teaching practice, as its influence is

reported to refer to 'what is taught', 'how it is taught' and 'how judgements about students are to be made'. The prescription of what has to be taught (minimising content, selected content) and its workplace focus, set up conditions for what can legitimately be taught. Equally, how teaching is to proceed (modular formats, fragmentation of units, reduced group work, different kinds of students, becoming more of a facilitator) is a product of what is prescribed in the accreditation procedures. These prescriptions are largely held to be unwelcome by the teacher. The changes to assessment practices and making judgements about students' prior knowledge were also prescribed and not welcomed. Prescriptions that undercut teachers' discretion (albeit for good or bad reasons) were of concern to a number of teachers. Hence, when the intentions are detailed they are to attempt to make teachers mere implementers. What is suggested earlier and elsewhere is that teachers are unlikely to be faithful implementers of ideas that they contest. More to this, the use of unwelcome external prescription may make aspects of the teachers' practice illegitimate. Again, the question is whether these prescriptions are warranted to improve the quality of educational provisions.

Professional development

Arising from the registration process, some respondents reported many teachers were being pressed to improve their credentials. Two areas of concern are evident in the data that pressed these teachers to take action. These are currency of vocational skills and level of qualification. That is, the external demands of the registration process pressed teachers into engaging in professional development activities. Significantly, according to the data, for many teachers in the vocational education system this meant augmenting their work experience or technical qualifications, whereas for those in industry it meant accessing basic instructional skills. So, the registration processes, as a quality measure, demanded teachers are current and qualified in both content and pedagogy. However, it is fair to say that the requirements for pedagogy were at a lower priority than those relating to currency of vocational knowledge. For instance, beyond having at least one member of staff qualified to teach, which was often a requirement for registration, there was no mandated requirement that all teachers in TAFE and private providers had to be registered teachers. It is unlikely that a provider would have been registered if only one member of the teaching team had appropriate vocational qualifications and experience. One curious factor in these data is that in Queensland it was only hospitality teachers who raised concerns about the currency of their knowledge. This seems at odds with earlier comments about the currency of their skills guiding the pre-CBT curriculum development processes.

Most changes were reported to be associated with the processes of becoming a registered provider of courses than in meeting the requirements carried by this registration. These activities however, went beyond mere administrative tasks as they influenced the nature of teachers' work, as also indicated in the previous section. Moreover, one of the outcomes according to an enterprise respondent was that teachers now had greater interactions with employers.

Transformations to teachers' practice as a result of the implementation of CBT

In sum, the impact of the implementation of CBT in the key areas of the enacted curriculum appears to be as follows. Comparison between the data in tables 4.5 and 4.6 and also between tables 4.3 and 4.6 reveal little change in the way that these teachers were guided by the syllabus before and after the implementation of CBT. Consistent with the earlier analyses, the degree of change in practice was dependent

upon how external interests manifested themselves. For example, where there were external requirements that teachers had to respond to there was evidence of action (e.g. current work experience). Yet where there was no mechanism to press for change little difference is evident (e.g. the utilisation of the syllabus prior to and after the 'uniform' implementation of CBT). So despite the effort expended in the development of uniform syllabuses across the VET sector, only in those areas that teachers felt the pressure of accountability was there most evidence of change. Perhaps the most commonly reported area of change was in assessment. Other changes associated with individualised curriculum and the shift to self-pacing seem to be particularly evident in the metals sector.

So, in curriculum practice and decision-making, where teachers were able to exercise their discretion, change appeared minimal. However, where external demands directly influenced teachers' activities this made an impact on their practice, essentially covering what is taught and how it is taught. They were precluded from gathering information about courses, which was externally organised. Also, because of external demands, some subjects stated that 'additional record keeping', 'monitoring learners' progress', 'monitoring and evaluating students' responsibility' were required to be undertaken. Views about these changes to practice were typically viewed negatively, even when they could be construed as having a positive impact on students' learning. One concern was that these demands took time away from other matters. So while there is evidence that the imposition of CBT had an impact upon teachers' work, there is little to suggest that this was perceived positively or focussed teachers more upon activities that are associated with student learning.

Analyses of the data suggest changes differed across the two sectors, possibly because of different antecedents. In the hospitality sector, it seems the shift was from a college-based focus to one based on national prescriptions that were founded on a national industry skills analysis. In the metals sector, the shift was from a system-based approach to curriculum decision-making to one found outside the system in industry advisory processes. Both shifts were based on prescriptions being founded on nationally-based processes (skills analysis, industrial changes) and managed by industry-based committees. So the outcome for both sectors was a shift to more uniform and national approach to curriculum decision-making. The main outcome for teachers seems to be linked to the management of the educational system—and gaining responsiveness from the educational system.

Where change has occurred it was associated with a more individualised approach to learning, a reduction in opportunities for group activities, a reduction in teacher involvement in determining content and planning vocational education programs, and promoting students' acceptance of responsibility. Increases in work are associated with administrative tasks such as enhanced requirements for reporting within assessment and monitoring activities. Therefore, in keeping with narrowing down the range of roles that teachers undertake, teachers' roles have become more focussed upon being *implementers* and *adapters* using Marland's typology. It seems that roles associated with being *developers* and *researchers* are the ones that have been eroded. This has raised the question of whether a de-professionalisation of teachers has occurred or is this part of the evolution of teachers' roles (e.g. Seddon 1997). While teachers have rights in the curriculum development process so do others. Is being responsive to changing societal demands an acceptable basis to transform parts of teachers' roles, as has been proposed through government reforms? Here it is probably important to separate the issues of 'scape-goating' of teachers as the problem within vocational education, and, as such, responsible for perceived deficiencies and issues of being responsive to the needs of other interests (e.g. government, industry, students, enterprises). The next section seeks to determine how the decade of CBT has been responsive to these interests. From that, it is possible to arrive at conclusions about the worth of the

reforms that provided both continuity and change for vocational education institutions and practitioners.

Evidence of the educational worth of CBT: Outcomes

The presentation of the data about the educational worth of CBT is divided into three sections, dealing with outcomes associated with:

- industry links
- realising enterprise and industry goals
- learning outcomes of students

The 'industry links and outcomes' section presents and discusses the data that inform about the productivity of relationships between industry and providers (OS2), the worth of these interactions (OK16) and whether the government goal of uniformity has been realised (OS4). The section headed 'realising enterprise and industry goals' presents and discusses the data on ways in which industry/enterprise goals have been met (OC7) and, specifically, whether CBT has improved competitiveness (OC6). The section on 'learning outcomes of students' presents and discusses the data on whether curriculum experiences are likely to generate higher order outcomes in students (OK15) and evidence of permitting transfer (OK18). A particular focus in these sections is on seeking evidence to support claims advanced by respondents. However, before commencing discussion in these three sections, some views about the overall efficacy of CBT are presented and discussed.

Overall views about the perceived efficacy of CBT

Industry and enterprise respondents and those teachers who furnished personal histories responded to the item 'What evidence is there that CBT has changed VET practices for the better or worse? (OS1) The data from these sources are presented in table 4.8 and accompanying tables 4.9 and 4.10 (both in appendix 2), which present data on the benefits of CBT and concerns about it, respectively.

Those respondents supporting the view that CBT has changed VET for the better are presented first. The views most commonly advanced claimed that the move to CBT has increased on-the-job experiences, the advent of workplace assessment, greater accountability and structures in the curriculum documentation which focus tightly on industry needs. Respondents claiming that CBT had changed VET for the worse, advanced concerns associated with a lack of student motivation, failure to acknowledge excellence, the danger of expediency in workplace practice and concerns that the private provision of VET might be undermined by the reduced periods of off-job time.

From table 4.9, some overall statements of evidence of the efficacy of CBT are presented. From this it is possible to identify proposed benefits and concerns. In table 4.10 (appendix 2), the benefits are particularly seen to reside with enterprises and industry. The adherence to industry standards, accountability measures associated with responsiveness and concerns about cost-effective provisions, relevance to their particular needs, the industry focus of the curriculum content, the amount of time apprentices are away from the workplace dominate. Little is made of the quality of learning apart from the reference to individualised instruction. Outcomes are very much focussed on enterprise needs with the exception being a reference to portability.

The concerns presented in table 4.11 are due only in part to an outcome-focussed approach to curriculum provisions. What is held as improving the educational worth,

is associated with matters of integrating curriculum between on- and off-job experiences, having intents and content which are relevant at the enterprise level, self-paced/flexible approached to learning, individualised instruction and, for some, the reduced time in the off-job provision. These initial views are now augmented by more detailed accounts from the range of informants.

The worth of relationships between providers of training and demands of clients

A key goal for improving the quality of vocational education provisions was to establish closer links between providers of VET and industry, in the first instance, and, more recently, enterprises. This goal aimed to make vocational education more responsive; to address demand-side requirements to use contemporary terminology. As noted above, there were existing arrangements for relationships between providers of vocational education courses and industry prior to CBT. However, the common claim was that these relationships were ineffective and that TAFE, in particular, was more concerned with supply-side than demand-side considerations. As stated in chapter 2, it was proposed that closer links and an industry-led vocational education system would improve the quality of curriculum provisions. To this end, networks of industry advisory committees were established for each industry sector and national competency standards were developed which were aligned to the industrial requirements of the workplace. So from a governmental perspective, an industry-led VET system and one that had strong links between providers and clients (industry and enterprises) was a key goal for the curriculum development and enactment process. Consequently, in this section, the achievement of these goals is discussed using the data. Three bodies of data are discussed below. Those addressing the productivity of these relationships, those about worth of interactions arising from these relationships and those about whether uniformity of outcomes was achieved as intended under the industry standards regime.

In order to understand the quality of the relationships between providers and client groups, all categories of subjects were asked 'In what ways are the new relationships among industry, training personnel and trainees productive or unproductive?' (OS2). The responses are presented in table 4.12 (appendix 2). In the left-hand column of this table, responses categorised into factors that have been proposed as either being 'productive' or 'non-productive'. To the right are columns used to aggregate respondents identifiable with these responses. These columns, from the left present the responses of industry/enterprises, teachers/trainers and students. Each of these groups of respondents is further divided into those from the hospitality and metals sectors.

Productive factors

The strongest pattern, and one across all groups of respondents, is that greater interaction is now occurring between VET providers and industry clients. In descending order of frequency of responses other factors are as follows. Industry and teachers propose that employers' needs are now being met. It is claimed, mainly from students but also their teachers, that student development, their career paths, and learning needs are being met through these closer relationships. Students also claimed that the expertise of their teachers is enhanced by these interactions. Teachers and students also supported the use of industry-determined benchmarks and outcomes. Non-specifically, it was claimed by a number of respondents that vocational education is more productive as a result of these interactions. Reference is also made to the workplace as a component of students' learning.

Non-productive factors

The list here is broader and responses less frequent. The most common response was from students claiming that the content of courses was not relevant to their work. The next most frequent comment claimed that little genuine interaction actually took place. Students and metals teachers also proposed this concern about the quality of interactions. A small number of respondents from the industry, teacher and student groups stated that the relationships underpinning the curriculum were failing to meet the needs of students. Other responses were from industry and teachers referring to the continued confusion over what CBT is, and its changing manifestations. Also, a small group of students and one teacher referred to the lack of motivation brought about by non-graded passes.

From the data in table 4.13 (appendix 2), it is possible to conclude that interactions between providers and clients of vocational education programs have increased. Moreover, those interactions are held to have resulted in increased understandings about goals for vocational education. This finding is supported by the data above in the sections of procedures influencing practice. Accompanying this are far more comments supportive of the outcomes of these interactions than those suggesting they are not productive. The responses indicating that industry/enterprise and students' needs are being met as a result of these outcomes is useful, as they are supported by the client groups most effected as well as others. So the pattern in these data indicates that enhanced interactions have been realised and these have, in the main, been positive. However, concerns are advanced by some about the genuineness of interactions, thereby questioning their relevance.

Interactions between industry and instructors in promoting skilfulness

Interactions between providers and clients are held to render greater understandings about how vocational education provisions should be best progressed in ways that meet the needs of client groups and providers (Billett & Hayes 1998). In particular, in the emerging enterprise focus in vocational education, the needs of enterprises and their requirements for skilfulness are clearly articulated. Employers, industry respondents and teachers providing histories were asked, 'What interactions between industry and instructors are valuable in promoting the skilfulness in trainees? (OK16). Table 4.13 (appendix 2) presents the data provided by this question, categorised under headings that denote the kind of negotiation.

In this table, the most frequent interactions are negotiations between providers and enterprises. Through these interactions greater understanding of enterprise need is claimed to be being realised. Yet, the comments themselves suggest one-sided negotiations that are concerned with providers knowing all about enterprises' needs, and, in some cases, to make enterprise training effective. There is no mention of learning to improve the provisions, except in terms of meeting enterprise needs. Interactions through industry placements and employers' understanding of teachers are also stated as being one-sided. Even the definition of successful teachers is countenanced in ways that are wholly associated with specific enterprise outcomes. Again, the findings here are similar to those in Billett and Hayes (1998), with enterprise needs dominating the relationship, goals and procedures. There is little in the way of reciprocity in relationships that might lead to mature associations between providers and enterprises. While this might be considered a naive goal, the requirement to address learners' needs is not. These have been shown to be overlooked in an enterprise-focussed approach.

Realisation of uniformity through CBT

One of the earlier goals for CBT was to achieve uniformity in the processes and outcomes of the nation's vocational education system. As discussed in chapter 2, the key concern by government was to make this system responsive to industry needs through the provision of national competency standards. It was these standards that provided the key intents upon which curriculum was to be developed, enacted and evaluated. Putting aside, for the moment, the worth of the uniformity view, in order to determine whether such an outcome had been achieved, industry, enterprise and teachers respondents were asked, 'In what ways has greater uniformity of training been achieved?' (OS4). Table 4.14 (appendix 2) presents summaries of data elicited from this item. These data are categorised into those indicating the means by which uniformity might be realised and those stating that this goal is not being achieved. The former are further categorised into:

- the use of designated competencies
- national curriculum documents
- driven by users
- clear outcomes

The data stating that uniformity is not being achieved are ordered in categories about:

- no guarantee of uniformity
- no uniformity
- not desirable
- no contact with other providers

Not achieving uniformity: Some illustrative responses

We use module workbooks developed in other States. On one occasion, subject NM026, I rang an institute in Melbourne to find out where to obtain the material for a practical exercise. The response was just because we wrote it doesn't mean we are using it.

Within the hiatus of change we've been going through over the last five or six years, it's not possible. We've done our bit to promote the growth of private providers, but most of them are truly shocking as providers go. It's not that hard to get accredited as a provider.

It is a hard enough job to achieve uniformity within one college, let alone across a system that has allowed numerous (private) providers of varying quality.

It hasn't been achieved. Unless you put in a moderation system and check what's going on, how can you say it's uniform? Like yes, the curriculum might be more uniform in terms of definition of standards and performance and content. OK, that's defined clearly, but you're going to be subject to individuality unless you go and do a moderation process. Every person who delivers xyz has to get together and look at the assessment instruments, the results you're producing, the content and use that in moderation to see whether you've got variations of highs and lows and then feed that back so all players involved get that information and can, if they agree with it, follow it or adopt it. But that's not going to happen because who's going to spend the money?

At the beginning, yes. However the training and assessment methods have varied to such an extent, that students select colleges to attend where it is easier to pass or become competent. There has been little funding provided to allow groups to get together to discuss these issues.

This question assumes that uniformity was not achieved before CBT. We are not sure that this is the case and are unsure that there is any evidence to support the notion that greater uniformity has been achieved. We would also question the assumption that uniformity is what is required. We believe that training should respond to the needs in each enterprise/context, although demonstrated competencies can be shown to address standards.

Achieving uniformity: Some illustrative responses

To some degree—as it is now national, but the module books printed in each State use different resource material, and so place a different emphasis.

Using competency as the base you get far more transferability of skills. But with that, you also need to have some enterprise specific training to meet the context of the workplace. A good competency provides the basis for uniform outcomes that can then be contextualised to a specific enterprise outcome.

Views about the achievement of uniformity are very much within the intended curriculum and are found in statements about what is proposed, by their sponsors, to happen when the curriculum is enacted. In table 4.14, under the category of 'Use of designated competencies' these data refer to prescriptive outcomes, the use of uniform standards and industry-focussed assessment. Under the category 'National curriculum documents', reference is made to the existence of uniform documents, tests and modules. All of the data about how uniformity is to be achieved refers to the intended curriculum. Conversely, most of the concerns relate to the implementation of the enacted curriculum.

With reference to uniformity not being achieved, these data are ordered into categories of:

- no guarantee of uniformity
- no uniformity
- not desirable

The data categorised under 'no guarantee' includes reference to different interpretations by individuals, different applications of vocational knowledge, uniformity of outcomes not being measured, different emphasis with curriculum materials and that it is only as good as the individuals using the materials. Under 'no uniformity' it is claimed that moderation would be required, but is not happening. Indeed, it is claimed that there is little interaction with others, that uniformity is impossible to achieve, curriculum is constantly changing and that diversity of students means there will always be differences which make achieving uniformity very difficult. Under the category 'not desirable' it is proposed that the needs of enterprises differ and people will resist being directed. These responses refer to what happens when or as a result of the curriculum being implemented. These data highlight the difference between curriculum as intents against curriculum as something that has to be enacted and experienced. Much of governmental efforts focussed on achieving outcomes through processes that sought to mandate individuals (teachers and students' behaviour). However, teachers' interpretations, interactions and responses are unlikely to be uniform.

The rationale for believing uniformity is achievable is embedded in behavioural views that propose individuals will respond to stimuli in a predictable way. Other views suggest that individuals make sense of what is required in a highly interpretative way. Hence, the curriculum that is enacted by teachers and experienced by students cannot be prescribed and pre-specified. Beyond these interpretative concerns which refer to usage of materials and their interpretations are other conditions which question the likelihood of achieving uniformity. Firstly, what comprises industry standards vary from situation to situation. What is acceptable in one workplace, may not be in another etc. etc. So, from the data here, not only is the prospect for uniformity held to be illusory, it may not even be desirable. Secondly, change is constant and unlikely to be unidirectional or uniform. Hence, achieving uniformity could only be momentary, if it could be achieved at all. Thirdly, as reported by these subjects, there is no effort being made to determine uniformity

through means such as moderation, which is often used to achieve reliability in assessment. Indeed, it is claimed that the level of contacts among vocational institutions has declined as a result of the market-based approach of VET.

The evidence provided by the subjects suggests that uniformity has not been achieved, is not likely to be achieved because such a goal is probably illusory, and the required moderation processes that might seek to achieve the goal of uniformity do not exist. The evidence earlier about fidelity in the use of syllabus supports the findings here that to rely upon the use of syllabus and published standards to mediate achieving uniformity is probably quite naive.

Meeting enterprise and industry goals

A key reason for the reforms within Australian vocational education and, in particular, the introduction of CBT was to make it more responsive, firstly to industry needs, and more recently enterprise needs. The goal was to be responsive to uniform industry standards developed through tri-partite industry processes. However, by now the need has shifted to reflect not only the requirements of industrial awards but the needs of the enterprises who engage in productive activity, employ and have need of skilled workers. Therefore, all classes of respondents were asked, 'What evidence supports the claim that industry/enterprise goals have been met?' (OC7) to determine whether and in what ways the introduction of CBT has been able to meet these needs. A synthesis of responses is presented in table 4.15 (appendix 2). This table is divided into two sections. The first identifies factors indicating how CBT has met these goals; the second identifies factors claiming CBT has not met these goals. The factors for both sections are listed in the left column of the table. To the right of this column are respondents from industry/enterprises, teachers/trainers and students. These subjects are further identified as being from the hospitality or metals sectors.

The responses to CBT contributing to industry and enterprise needs are divided into three sub-categories of evidence:

i) outcomes

ii) curriculum process

iii) curriculum arrangements

Those factors indicating CBT has not contributed are less easily categorised as they are light on evidence statements. They are presented below.

The contribution of CBT in realising enterprise and industry goals: Outcomes

The most common claim in this section, and one made by all classes of respondents is that CBT has delivered the skills enterprises require. Further, students, in particular, claim that they are now multi-skilled. Teachers propose student competence is high under CBT. Students' claim, in a non-specific way, that there is evidence that CBT has realised the goals of enterprises and industry. These respondents propose evidence of CBT furnishing enterprises with the skills they need, producing competent and multi-skilled students. These factors draw support from other classes of respondents. These then are the outcomes claimed as evidence.

Curriculum processes

Curriculum processes here refer to evidence of how the curriculum processes under CBT have realised enterprise and industry goals. Teachers and representatives from

industry and enterprises claim that CBT is responsive to enterprise needs including being customised to these needs. Teachers, industry respondents and a student respondent claim that CBT is also responsive to industry standards. Components of workplace learning were identified by teachers and students as realising goals of responsiveness in their courses. Students note what has been reported elsewhere, that CBT provides opportunities for individual work. Responsiveness to industry standards, customised to enterprise needs and providing opportunities for individual learning have predominated in the findings on curriculum processes reported as realising industry and enterprise goals.

Curriculum arrangements

Curriculum arrangements refer to organisational factors. Industry and teacher representatives claim that CBT has resulted in the availability of additional trainees. A teacher respondent states in each case that CBT has brought about greater choice in providers and the training itself takes less time. Teachers and industry respondents claim that enterprises' goals must be being met because of their continued use of their provisions. Choice in provision, additional trainees and reduced time are proposed as means by which the organisation of curriculum is reported as having met industry and enterprise goals.

The responses from industry/enterprise respondents are associated with meeting the skill needs of enterprises and having arrangements in place to customise and also be responsive to enterprises.

Failure of CBT to realise enterprise and industry goals

The most overwhelming response, for both sections, was from students, in particular, but also from teachers and industry respondents that there is little or no evidence that CBT has met the industry and enterprise goals. These responses are from, in order of magnitude, metals students, hospitality students, metals teachers, hospitality teachers and a metals industry representative. Unfortunately, these respondents failed to furnish any evidence to support their claims. Evidence claiming CBT has failed to meet enterprise and industry goals is associated with:

- employer dissatisfaction
- employer confusion; diversity of needs
- lack of relevance
- difficulty of courses
- theoretical knowledge not being learnt

The findings here suggest evidence that the current vocational arrangements are meeting enterprises needs in terms of the skills they require. Knowing about and being able to meet enterprises' needs and those of individuals are held as some of the most significant reasons why CBT is to be valued. But it is uncertain whether this satisfaction stems from CBT itself or associated initiatives. Interactions with enterprises and individualised curriculum arrangements are not directly a product of CBT. For instance, there is no reference to enterprise specific competencies being seen as the means for enterprise outcomes. Rather, it appears, as stated elsewhere that the kinds of experiences provided in vocational education currently which are likely to develop skilfulness are not attributable to CBT.

Needs of industry and enterprise are being met: Some illustrative responses

I think the current skills training meets my needs in most cases, but today they (apprentices) seem less responsible than in my day. Some are really good if you direct them—but I wouldn't be

game to send some of them on a job by themselves. They can weld and do things OK, but they can't think for themselves or make decisions. – enterprise view

They are being met, in terms of being able to organise what they want and how they want it, especially with private providers. We find with our training in the workplace that the employer has more input into what is being taught, and this makes them happy, and the trainees happy. They're not learning a whole lot of irrelevant stuff.

Where a complementary relationship can be found between players, industry and enterprise needs can be met.

Response from industry has been well received in the training of new apprentices and some of the awards and achievement of students to gain higher positions within their companies, e.g. [Gained] *a responsible position, drawing office CAD CAM.*

Goals of enterprises and industry are not being met: Some illustrative responses

They are not being met. I have employers ringing me asking what Js and Ms stand for—asking me why when they send an employee to college, they are not able to interpret the results they get back.

Economically they seem to be being met (i.e. less time for apprentices to be away from work). However, statistics [show] *that electrical accidents and fatalities have increased markedly—1988, 423 accidents and six dead, 1998, 948 accidents and 22 dead. Employers' feedback seems to be that students can't apply what they are supposed to have learnt.*

Maybe the needs of industry generally and at the low end are being met, but the needs of the individual who wants a career in cookery are not. The training system trains to a minimum standard which is well below the requirements of the high end of the market. So trainees are restricted in their career path.

Depends on the company—the autonomy given to the teacher, the support offered by management and union, their belief in the power of learning to assist workplace change. The introduction of the National Training Framework is evidence that enterprise needs have not been met sufficiently.

Not much to do with CBT. Can we meet the needs of industry as industry changes—this can only be determined on an individual basis and no system will satisfy all.

Not sure that there is any evidence. The changes in the automotive industry have been important. For example, the range of work we do has changed over the years, we don't overhaul fuel pumps or automatic transmissions because this is done by specialist workshops. But all apprentices do these things at trade school.

Evidence of CBT improving competitiveness

A goal for vocational education over the last decade has been to make industry (and more recently enterprises) more competitive. In particular, CBT was proposed as a means to secure this outcome as part of the move towards securing a skilled Australia, a clever country and for enterprises here to become both import competing and successful with exporting goods and services. In order to gain insights into the efficacy of CBT in achieving these goals, industry, enterprise respondents and teachers were asked, 'What evidence is there that changed training practices are developing skills that improve competitiveness?' (OC6) It is also anticipated that this data will furnish additional evidence about how CBT is meeting enterprise needs. Table 4.16 (appendix 2) presents a synthesis of the responses to this item. The table is divided into two sections. The top section presents categories of responses indicating evidence that competitiveness has improved under CBT. The lower section presents responses claiming that competitiveness has not improved under CBT.

As with table 4.15, responses to CBT contributing to competitiveness are divided into three sub-categories of evidence:

i) outcomes

ii) curriculum process

iii) curriculum arrangements

The factors indicating CBT has not contributed are less readily categorised.

CBT's contribution to achieving competitiveness: Outcomes

Evidence in the form of outcomes claiming enterprise needs are being met include multi-skilling, student competence and enhanced relevance. In this section, the most common response is that enterprise needs have been met in ways that facilitates their competitiveness. Both teachers and industry/enterprise respondents provided these responses. Statements claiming that multi-skilling, enhanced relevance and student competence had contributed to enterprise competitiveness were from teachers. So it is claimed through these statements, that individuals' abilities such as multi-skilling, as well as curriculum processes that met enterprise needs were held to result in greater competitiveness. The detail of responses here suggests that as well as addressing the needs of enterprises through learning processes, that taking account of particular enterprise needs resulted in enhanced relevance in the outcomes.

Curriculum processes here refer to evidence of how the curriculum processes under CBT have achieved competitiveness. It is proposed that work-based learning and improved access to training have assisted enterprises' competitiveness. These factors again focus on the ability for curriculum provisions to be relevant to enterprise needs. So, again, the issue of curriculum processes that focus on relevance in terms of particular enterprise needs is central to views on how CBT has been effective.

Curriculum arrangements refer to organisational factors. Here, two sets of factors are advanced; choice in provider and repeat business. It is proposed that the market-based provisions have been useful in enhancing competitiveness and that evidence of the efficacy of these arrangements is found in enterprises continuing to employ apprentices and send them to the providers.

It seems that the ability of training arrangements to meet enterprise needs in terms of curriculum provisions and student learning is the key means by which competitiveness has been realised.

Evidence that competitiveness has not been met

Only two responses here reflect more than single respondent concerns. Firstly, it is claimed that there is little or no evidence to make connections between CBT and improved competition. Mainly teachers state this view, although one industry respondent also advanced this view. Secondly, beyond this are claims that because enterprise needs are so different there is little prospect of being able to meet everyone's needs. Other responses refer to training not being important (e.g. individuals' attitudes more important than training). Evidence was furnished that the inadequacies of the teaching and assessment processes under CBT can be linked to a decline in standards of occupational health and safety.

It is claimed, therefore, that there is not sufficient evidence to advance claims that CBT has aided competitiveness. More precise claims of evidence relate to the diversity of needs and the decline in work safety.

In terms of outcomes, the most common response is that enterprise needs have been met in ways that facilitates their competitiveness. It is claimed that multi-skilling,

enhanced relevance and student competence had contributed to enterprise competitiveness. The curriculum processes that aided competitiveness have been categorised as work-based learning and improved access to training. These factors again focus on the ability of curriculum provisions to be relevant to enterprise needs. The relevance of curriculum process in terms of particular enterprise needs is central to views on the effectiveness of CBT in realising competitiveness. It is also proposed that the market-based provisions have been useful in enhancing competitiveness and that evidence of the efficacy of these arrangements is founded in enterprises continuing to employ apprentices and sending them to the providers. Conversely, it is claimed that little or no evidence exists to link CBT with improved competition. More specifically, it is claimed that because enterprise needs are so different there is little prospect of it being able to meet those needs. Others claim that in terms of competitiveness, individuals' attitudes are more important than training. Also, the inadequacies of the teaching and assessment processes under CBT were linked to a decline in workplace safety.

The clearest finding here is that meeting enterprise needs in ways that furnish workers who are multi-skilled in that environment are prized most. Interactions that secure these arrangements are also valued. The very specific focus on competitiveness here is one centred on enterprise need, rather than at the personal or industry level.

Higher order outcomes for students through current curriculum practice

One of the often-stated goals for the reform of the VET system is to make the Australian workforce more responsive and adaptable; a smart workforce. These requirements are based on individuals having the kinds of knowledge that will permit them to be adaptable and flexible. Consequently, determining how CBT has furnished the kinds of experiences likely to develop the knowledge required for adaptability is a key indicator. Extensive research within cognitive psychology suggests that the desired outcomes are dependent upon the degree to which learners have been able to engage in combinations of routine and, importantly, non-routine problem-solving. Experiences in the enacted curriculum that provide opportunities for independent and collaborative problem-solving are valued particularly for this purpose. As a consequence, industry, enterprise and teacher respondents were asked 'In what ways are trainees able to solve problems on their own or collaboratively? (OK15). Table 4.17 (appendix 2) presents data categorised into responses referring to factors associated with process and then those associated with outcome. As with other tables, these factors are listed in the left column, next to this the responses pertaining to industry/enterprise, the next, teachers and on the right a column that provides instances of the factors.

Evidence of higher order outcomes being achieved: Some illustrative responses

They can solve problems but not necessarily because of CBT, because CBT was usually broken down into its component parts, so you did quality, communication, OH&S, then you did mechanical components, engineering science or whatever. You could wrap all those up and put them into a project and actually design those outcomes … in essence can't be assessed unless they're assessed through that holistic approach. When you take training from a holistic point of view, you just can't assess individual pieces of information. You have to assess the whole activity. The trainee has to have the underpinning knowledge to be able to perform the task or skill. The technical understanding has to be there, and he has to have demonstrated the technical understanding by the fact that he's done the job well. – metals industry respondent

There is now a provision in courses for students to collaborate or co-operate with one another. But given the atomistic nature of CBT it's more oriented towards individual skills.

Processes of independent and collaborative problem-solving

The responses to how processes of collaborative and independent problem-solving have been accommodated in the curriculum provisions are closely associated to the enacted and experienced curriculum. The enacted curriculum refers to instructional practice and approach of the teachers, whereas the implementation refers to both enacted and experienced curriculum through informal experiences, learning in the workplace and students' dispositions towards their engagement in those activities.

Instructional approaches and strategies: Enacted curriculum

The approaches to instruction used by teachers comprise the process responses to the development of higher order kinds of knowledge in students. The opportunity for problem-solving in group activities, project work, self-managed instruction, interactions and being taught problem-solving strategies are proposed as the means for developing knowledge through problem-solving activities. Below, detail is provided of how these activities press learners into goal-directed activities both in groups and individually. It is the kind of thinking and acting proposed here which are believed to be central to developing the knowledge required for adaptability. In offering criticisms, subjects focussed on the instructional approaches suggesting that students learnt by rote, which is not normally associated with development of higher order procedures. Some subjects also claimed that there was too much support for individual problem-solving to be effective. It was also claimed that there were not enough resources for these problem-solving activities to continue and that learners were isolated thereby inhibiting their ability to work collaboratively.

Implementation: Enacted and experienced curriculum

Other factors associated with problem-solving by students were associated with implementation referring to both the enacted and experienced curriculum through informal experiences, learning in the workplace and students' dispositions. The responses here suggest that unintended process during instruction and workplace experiences are sources of students' engagement in problem-solving. In addition, students' dispositions will determine how they engage in these knowledge-building processes.

Outcomes of problem-solving

The responses in table 4.16 to outcomes are readily categorisable into those claiming negative outcomes and those claiming evidence of improved performance. The former was more frequent than the latter. However, in overall terms, across the table the evidence for positive outcomes was far stronger.

Those reporting negative outcomes refer to 'no change', 'limited ability to problem-solve', 'got worse', 'no evidence', and 'outcomes too narrow'. These statements can be further divided into those that suggest there is no change and those claiming that the changes that have occurred are not desirable. The only statements of evidence are those that claim that an ability to problem-solve has not been developed and where it exists it is quite weak.

Two statements of positive outcomes are available, both from industry respondents who claim that now learners do not seem to need as much help and that they are better able to work collaboratively.

In sum, the strongest body of evidence is that a series of instructional activities and unintended processes and factors provide a basis for students to engage in problem-solving activities of the kind that are likely to secure the forms of knowledge which underpin adaptability. A lesser body of views, mostly without statements of evidence, suggest limited evidence of the positive outcomes, although contradicting this, some evidence is advanced by industry respondents. The important finding here is that the kinds of experiences the students are engaging in seem likely to be a useful source of higher order outcomes. However, the question remaining to be addressed further regards the degree to which these are the direct product of CBT or are they the product of other, albeit associated processes?

Having taken account of the responses of industry and teachers, table 4.18 (appendix 2) presents the responses from students to the same question. The students' responses in table 4.18 are presented in the same way as those in table 4.17. The process factors are presented and discussed before the outcomes.

Processes of problem-solving

In ways similar to the industry/enterprises and teacher responses, students referred to activities within the enacted curriculum comprising engagement in the course and instructional strategies as well as those that incorporated experiences that were not intended as part of the enacted curriculum.

Instructional approaches presented experiences that pressed learners into problem-solving as part of the enacted curriculum through engagement in instruction (group-problem-solving, self-managed learning, guidance by experts) and the experiences provided through on-course experiences, activities and procedures.

There were also reported opportunities that were not directly a part of the enactment of what was intended. These opportunities arose when these individuals were engaged in workplace activities, just by learners undertaking tasks, their approaches to tasks and the application of what they had learnt in the college to a workplace situation. Many of these opportunities can be seen as what the students learnt as a product of engagement in the enacted curriculum—the experienced curriculum.

Outcomes of problem-solving

The responses in table 4.17 to outcomes are readily categorisable into those claiming negative outcomes and those claiming evidence of improved performance. Again, as with the responses in table 4.16, the pattern here is a division between those stating there is no evidence and those calling upon quite specific evidence to support their claims that there are positive outcomes.

Those reporting negative outcomes commonly state that the processes of CBT failed to engender independent and collaborative thinking, yet fail to furnish evidence. Those that do, refer to inadequate preparation and that preparation being too narrow and impractical. Other responses refer to lack of opportunity.

Two kinds of statements of positive outcomes are evident. These are:

i) those claiming how knowledge can be acquired as a result of experiences in the course

ii) a strong set of responses stating that understanding had been developed as a result of participation in training programs

So, it seems that these subjects were able to make links with outcomes of the kind that permit engagement in independent and group problem-solving.

In sum, students claim that the kinds of learning experiences they access as part of the curriculum provide the kind of opportunities required to engage in higher order thinking. These include, group-problem-solving, self-managed learning and guidance by experts. Also, related experiences and activities such as those in the workplace are seen to assist with this process. The significant point here is that most of the factors are not central to CBT. Instead, they reflect practice that was either common prior to CBT or are an indirect outcome of the implementation of CBT.

Evidence of transfer

Associated with the goals of adaptability and flexibility is the ability to transfer knowledge from one circumstance to another. This is fundamental to the worth of any educational initiative. If individuals lack the ability to transfer they will have difficulty dealing with new situations and applying what they learn in different circumstances. Furthermore, one of the transfer acts many learning in vocational education have to secure is that from the classroom to the workplace. Consequently, it is important to understand the degree to which vocational education curriculum provisions can secure transfer, firstly from the circumstances where knowledge is learnt to target circumstances (e.g. classroom to the workplace), but also from situation to situation in vocational practice.

Consequently, all subjects were asked about the ability of students, prepared under the current CBT arrangements within vocational education, to transfer knowledge. They were asked 'What evidence is there that trainees are able to transfer knowledge and skills to new situations' (OK18). Tables 4.19 and 4.20 (both in appendix 2) present syntheses of the data. Table 4.19 presents the responses from industry/enterprise informants whereas table 4.20 provides those of students. The format is similar for both tables. They are divided into sections reporting data presenting evidence that transfer occurs and ones that offer responses contesting transfer.

In table 4.19, the evidence supporting the transfer of knowledge is of two kinds, outcomes and process factors.

Enterprise/industry informants' perception of evidence of transfer: Outcomes

Three kinds of transfer are reported here; 'across workplaces', adaptation to innovations and 'transferring basic skills across settings'. Evidence is provided of students being able to apply their knowledge to different workplace settings; being able to adapt to new technology and demands in the workplace; and having the ability to apply basic principles in different ways in different contexts. The first of these transfer outcomes is reported only in the hospitality industry. Also, it is hospitality industry/enterprise respondents who refer to transferring basic skills across the workplace. However, this may well be a part of employment in this industry more than any other factor.

Enterprise/industry informants' perception of evidence of transfer: Process

Only two individuals' responses here report that as work practice has become more standard, the transfer task is eased. The other process factor refers to the quality of individuals' determining transfer.

Enterprise/industry informants' perceptions contesting transfer

Four factors are offered as evidence that current VET provisions do not assist transfer. These are about goals for transfer, an assessment issue premised on

individual factors and the lack of evidence. Metals industry/enterprise representatives furnish much of this evidence. It is claimed that as work performance is contextualised expectations about transfer may be unreasonable. Individual factors are mentioned here also as a factor in transfer. A metals respondent raises the view that transfer is an issue of assessment.

The evidence here suggests that transfer does occur, albeit reported more in the hospitality sector than elsewhere. However, the fact that students are able to work across different kinds of workplaces is indicative of their ability to transfer knowledge. Somehow students are learning knowledge that is transferable. This could be associated with the activities and opportunities provided across hospitality enterprises as a form of enacted curriculum. So it remains for further deliberation before suggesting whether on its own CBT does or does not facilitate transfer.

> *CBT has nothing to do with transferring knowledge and skill. CBT is just an assessment process, not a learning strategy. Skills will always be demonstrated under specific conditions and these conditions may or may not circumscribe the transferability of that skill, but it depends on a lot more than whether the training is competency based or not.*

The responses from students are found in table 4.20, which has the same set of headings as those in the previous table. In table 4.20, the evidence supporting the transfer of knowledge is of two kinds; outcomes and process factors. There are a number of subjects who claimed transfer to be occurring, yet offered no evidence.

Student perceptions of evidence of transfer: Outcomes

There are three categories of data suggesting transfer outcomes are being achieved. Firstly, the ability to apply basic skills and principles across different workplaces, something supported more by hospitality students than others. Secondly, transferring knowledge learnt in the classroom to the workplace. Thirdly, developing further skills have been realised as building on what has previously been learnt. So the evidence about transfer is provided by individuals who have themselves engaged in the transfer tasks.

Student perceptions of evidence of transfer: Process

The process factors are proposed by the students as being twofold; having understanding and learning in the workplace. Firstly, it is held that transfer is underpinned by understanding and that understanding has been secured through engagement in vocational education programs. That is transfer has been achieved as an outcome of participation in training programs. Three respondents also suggest that workplace learning experiences assist the transfer of knowledge. This data may well relate to the application of the knowledge in another circumstance.

Student perceptions contesting transfer

By far the most common response was that there is no evidence to suggest that transfer has occurred. This view was held particularly frequently within the metals sector. Again, the lack of evidence is disappointing here. The other statements of evidence contesting transfer, relates to the quality of training and statements questioning the relevance of what has been learnt during the program. So again the dilemma when dealing with these data is of determining between statements without instances or evidence against those offering some statements of evidence of transfer. Certainly, there is a good deal of consistency between the findings in tables 4.19 and 4.20; particularly in the areas of identifying where transfer is occurring. The students have advanced that understanding and transfer has been gained through the vocational education programs.

Transfer across workplaces, adapting to innovations and transferring basic skills across settings is provided as evidence of the efficacy of the CBT curriculum in securing transfer. The first of these transfer outcomes is reported only in the hospitality industry. Also, it is hospitality industry/enterprise respondents who refer to transferring basic skills across the workplace. However, this may well be a part of employment of this industry more than any other factor. As it is claimed that work performance is contextualised, simple propositions about transfer need to be considered cautiously. Hence, high expectations about transfer between the school room and the workplace may be unreasonable. Individual factors are mentioned here also as factors in the transfer of knowledge.

Students claim the ability to apply basic skills and principles across different workplaces is evidence of transfer outcome. Hospitality students more than others supported this outcome. Students' ability to transfer knowledge learnt in the classroom to the workplace and building on what has been learnt, was also proposed by students. These outcomes are all about transfer as a product of having to engage in transfer tasks. In consideration of process, students claim that transfer is underpinned by understanding and that understanding has been secured through engagement in vocational education programs. Also, it is suggested that workplace learning experiences assist the transfer of knowledge. Statements of evidence contesting transfer, relate to the quality of training and those questioning the relevance of what has been learnt during these programs.

In all, there is agreement between the views of teachers and students in particular that it is the kinds of experiences that students engage in that are likely to determine transfer. There are experiences included as part of the enacted curriculum and there are others that are part of the experienced curriculum which are often associated with work-based experiences. So it seems that the activities within the instructional process, that teachers organise, and the experienced curriculum which comprises the totality of the curriculum experience are key determinants in the development of transferable knowledge.

Alternatives

In this final section, data is presented and discussed which suggests alternatives to current curriculum practices within VET. The purpose of seeking these alternatives is twofold. Firstly, to identify patterns of responses which are reactions to the current arrangements and, secondly, to fashion views about approaches for the future. Two areas of interest are discussed here; alternatives to instruction and curriculum development processes.

Alternative approaches to instruction

In order to determine how best curriculum practice in the area of instruction should proceed, teachers and enterprises and industry respondents were asked, 'How would you change instruction to best develop student learning?' The responses are presented in table 4.21 (appendix 2).

The responses that are provided most frequently refer to the provision of experiences for students that will help them learn. These include understanding the needs of students, selecting instructional strategies most appropriate to their needs and what has to be taught and also the provision of interactive and workplace experiences. These responses are of a similar kind to those advanced in the sections above about securing adaptability and transfer. Only four respondents suggested there was no need for change. Responses categorisable under 'use of appropriate strategies' refer to selection of strategies most suitable, the need for both 'knowledge that' and

'knowledge how' to be addressed. The approaches to instruction suggested here really emphasised experiences that engage the learner in goal-directed activities (problem-solving, practical activities, project work etc.)—the experienced curriculum. Therefore, enhanced engagement and activities are proposed by the subjects as means to improve instruction. These suggestions concur with the kinds of experiences and guidance suggested in the literature for developing knowledge required for both routine and non-routine tasks. They are also consistent with the data earlier that identified factors associated with developing robust knowledge. Within the data are requests to change from particularly a reliance on modularised materials and self-paced approaches that have no adequate support from teachers. The second most frequent category of responses proposes a shift to place the students at the centre of the curriculum deliberations. Assumptions about students' learning are the consistent theme here, not what they wish to learn. In placing the focus of curriculum deliberations on industry and enterprise and seeking efficacy in provisions, perhaps the needs of the key client group has been discarded.

So there is strong focus on a shift to process concerns in these responses. The responses here favour alternatives that engage students in active learning tasks with arrangements for both individuals and peer-based activities supported, however, by adequate teacher input. These are consistent with what was proposed in earlier sections dealing with the development of robust knowledge.

The responses here suggest that the quality of curriculum implementation, more than statements of outcomes, offer the basis for improved provisions within vocational education. Taking the view that the core of CBT is associated with the use of prescribed outcomes and instructional, assessment and accreditation processes that are shaped by those outcomes, it is proposed that this focus is insufficient. Rather, the subjects emphasise processes of educational practice as a means to best realise quality educational outcomes. Understanding students' needs, selecting the most appropriate strategies, the provisions of activities that engage learners in problem-solving tasks and the provision of guidance by teachers are proposed as being central to learning the knowledge required for the workplace. Therefore, there has been consistency in a range of responses concerned with process considerations that are likely to secure the outcomes sought by industry, enterprises and students. It is these outcomes which are advanced as key policy goals. However, contrary to a policy framework that privileges outcomes, the response here is concerned with processes.

Alternative approaches to curriculum development

Alternative approaches to the development of curriculum were also elicited from teachers and enterprise and industry respondents. They were asked, 'How should curriculum be best developed for your industry/enterprise?' The responses are presented and discussed below table 4.22 (appendix 2). The alternatives suggested by the respondents are in the left column. The next two columns identify respondents from enterprise and industry in the first and teachers in the second. These columns are each divided into those representing hospitality and metals. The column on the right provides instances of the subjects' responses.

The responses suggest wider roles for teachers, a more collaborative approach to curriculum development, and a focus upon enterprise provisions. The responses emphasise involvement by a number of different kinds of 'stakeholders'. However, for a considerable number of the respondents this involvement was to be collaborative. Hence, the analysis suggests that the 'top-down' approach has not been sustained. Rather, it seems that the 'development of enterprises needs', and the determination of industry needs' are to be associated with a broader involvement by teachers. The

proposed process is one premised on collaboration among a number of interests to determine how the specific needs of enterprises can be represented through intents and needs which have some durability across the industry sector(s) where the knowledge is likely to be applied. In addition, consideration for securing this knowledge, which can be provided best by teachers is necessary in order to consider how the goals and needs of students can best be mediated in curriculum development processes. So the development of the intended curriculum cannot be the sole domain of just one voice. It needs to be the outcome of a collaborative process that takes account of national industry needs, the particular requirements of enterprises where vocational practice is enacted and those of the learners who participate in these courses. There is also the need for consideration of the development of knowledge that is robust enough to transfer within the industry context, is adaptable to enterprise needs and fulfils individuals' vocational aspirations.

The data on the implementation of curriculum is supportive of what is advocated in previous sections. That is, there has to be a clear consideration of what is implemented in terms of teacher involvement, adequate resourcing and understanding students' needs. This is quite different from the view of enacting curriculum premised on pre-specified curriculum intents determined by industry. Instead what is being proposed is one concerned with determining students' needs (researching) and developing the most appropriate responses (developing and modifying). It will also likely demand of teachers a wider range of skills than those required under the CBT model, and which value mere implementation over other concerns.

Summary

The data presented in this chapter suggests that CBT as a model of curriculum development has had, in some ways, profound effects upon the intended and enacted curriculum, whereas in other areas its impact has been minimal. However, there remains the problem of distinguishing between CBT itself and the broader CBT movement, and their respective influence upon curriculum. Taking the delineation of CBT and the broader CBT movement that was advanced in chapter 2, the following are summary statements drawn from the findings in this chapter.

Separating CBT from the CBT movement

The core elements of CBT as a model of curriculum are the identification of competency statements, their linkage to curriculum processes and, in particular, manifestation in statements within curriculum documents about the outcomes of engagement in vocational education programs. This includes determining need from industry/enterprises for the intended curriculum and the accreditation processes which are used in an attempt to manage the enacted curriculum. The broader CBT movement includes the evolving platform of reforms with which CBT has become associated. These included the drive towards self-pacing and resource-based approaches and the marketisation of VET. What is repeated throughout the discussion on the analysis of the data in this chapter is that in many ways it was elements of the broader CBT agenda and even factors pre-dating CBT that continue to secure the kinds of outcomes desired for an adaptable workforce. These largely include the kinds of experiences students of vocational education have in the classroom and workplace, the interactions between providers and enterprises and the enhanced access brought about through a more open VET market. Of those factors central to CBT, the accreditation processes can be seen to have impacted on curriculum practice in ways such as enhancements to teachers' currency and the push for them to be responsive to external needs. There is little evidence, however, that having tightly and highly prescriptive outcomes enhanced curriculum practice, in either identifying enterprise needs,

guiding instruction or furnishing valid assessment. It did however, see greater uniformity with some aspects of teacher practice, in particular assessment.

Transforming teachers' practice

CBT has transformed some parts of teachers' practice. In particular, those components that are public or have an interface with external agencies or institutions are most likely to have been transformed. So for instance, the range of activities that teachers were permitted to engage in were reduced initially, thereby curtailing key parts of their practice (e.g. determining curriculum intents and content). Also mandated assessment practices and accreditation demands placed external pressures on teachers. Certainly, as part of the broader CBT movement, the moves towards variants of the self-paced approach to vocational education were enacted which changed the nature of the enacted curriculum. However, other components of teachers' work remain relatively unaffected. In particular, the kinds of activities in hospitality courses which engaged students in group activities and which are similar to those they would encounter in the workplace.

Links between providers and enterprises

Recent changes to the context in which VET is enacted which include the shift to an enterprise-focus and the marketisation of VET has seen greater interactions between provider and enterprises. The shift from an internal college-based approach to determining intents and content was initially to an external 'industry-based' focus. But now the shift is to enterprise needs, with increased interactions between providers and enterprises. It seems that all client groups (e.g. students, enterprises, and industry) have welcomed these interactions and their outcomes, when they are reported as occurring. These intentions seem to provide clearer goals and priorities for VET programs as well as maintaining the relevance of provisions. However, these interactions make demands on both enterprises and providers in terms of the determination of particular intents and developing an intimate knowledge of enterprise requirements.

Uniformity in provision

Overall it seems that uniformity in terms of the outcomes of vocational education programs was an unlikely goal that has not been realised. Differences in antecedent circumstances, the lack of a comprehensive process of professional development for teachers, the array of situational factors in each setting and the differing needs of enterprises, rendered uniformity problematic and unachievable. Of the areas of curriculum practice, it seems that assessment practice is the one where uniformity was realised in adherence to assessment processes. However, even here, the lack of moderation processes or mechanisms aimed at securing reliability were absent. Indeed, it was stated that the reduced interactions between TAFE providers arising from competition policy have eroded the possibility of reliability.

Improved competitiveness

Central to improved competitiveness was held to be improved access to VET programs, work-based components, and more recently greater interactions with enterprises and determination of their need. Significantly, these are held to be the product of curriculum processes being transformed by the marketisation of VET, rather than CBT itself. Although it is fair to note that the shift to external sources of intents and content was a product of CBT, many of the reported bases for VET making enterprises more competitive are associated with market-based provisions.

Adaptability and transfer

Central to the governmental concerns, which prompted the introduction of CBT, was the need for adaptability and skilfulness in the Australian workforce. What the data here has shown is that the most likely basis for these to be secured can be found in the kinds of experiences that students access in both the classroom and the workplace. Consistently, it has been reported that a combination of experiences (e.g. project work, group activities, teacher-guided activities and self-managed activities) are those which secure the knowledge required for adaptability and skilfulness. However, it may well be the combination that is at the core of the utility of these arrangements. Not all learners reported being able to manage the demands provided by self-managed activities and concerns about the inadequacy of teacher support were reported in both the quantitative and qualitative data. Hence, the quality of the enacted curriculum, something managed best by teachers is likely to be central to the quality of learning and the prospect of securing the outcomes desired by industry, enterprise and individuals.

Again, of these experiences, many were in place prior to CBT. Others, for example the shift to self-pacing, can be associated with the broader CBT movement. However, there is little here to suggest that CBT itself has contributed to adaptability and transfer, except in the provision and assessment of routine experiences and outcomes. While these are important and necessary for performance, on their own they are not adequate.

In chapter 7 these findings are briefly revisited and from them recommendations for progress advanced. It seems that some combination of means that value the external input into intents and content, but also value an approach that emphasises the processes of enacting curriculum to provide experiences that can secure the outcomes required by enterprises, industry and individuals is required.

5 Assessment practices

Charlie McKavanagh

This chapter reports on the Assessment Practices Sub-project. It is organised under the following headings: Context of the sub-project; Assessment of expertise; Methods of data analysis; Results; Discussion; and Conclusions.

Since assessment (and the results and credentials which arise from it) is a prime motivator of staff and student activity, its control is also a powerful manager of change. The CBT movement has placed great emphasis on changing assessment practices to make them more uniform nationally and to ensure that these practices conform more rigidly with perceived industry needs as defined in competency standards. Despite this move for conformity, chapters 4 and 6 of this report demonstrate that curriculum design and teachers' practices retain a degree of diversity. While practices differ, the issues that surround assessment under CBT show a greater degree of uniformity across industries and States than for curriculum development or teaching.

As outlined in chapter 1, at the outset of CBT the prime goal of the reform movement was to improve the flexibility and adaptability of the Australian workforce in order to make it more globally competitive (Dawkins 1988). The implementation of CBT followed a policy-focussed debate about a more skilful ('clever') country and associated government supported agreements, between some employers and some unions, about reforms to this country's vocational education system (Dawkins & Holding 1987; Dawkins 1988). The reforms aimed at securing a more skilful and productive workforce. Also as stated in chapter 1, the central question of this research is derived from these goals and can be stated as:

> *What evidence is there that CBT has contributed to the development of an Australian workforce which is adaptable and flexible?*

And the research question relevant to this chapter on assessment is:

> *How have competency-based assessment practices been able to furnish information about individuals' achievements against benchmarks, thereby permitting judgements about student performance, credit and prior knowledge?* (Major Project 5)

The sub-project addresses the question by taking skilfulness as the benchmark against which the results pertaining to student assessment are appraised. As also noted in chapter 1, skilfulness is accepted in its broadest meaning, which includes the development of capacities (conceptual, procedural and dispositional) required to engage in a vocation. Vocation here is also taken at its broadest meaning (e.g. being a parent, a classical scholar or a plumber is practising a vocation). Activities both of a routine and non-routine kind are included. Flexibility and transferability are desirable in individuals wishing to pursue personal and career goals, as they are to the industry itself. As noted in chapter 2, development in our understanding about expertise has increased, and clearer understandings about workplace requirements have been identified in recent years. Advances in cognitive learning theory and the nature of expertise have also contributed to a greater understanding of the development of expertise. As a result, it is clear that vocational education needs to prepare workers who are 'able to generate and evaluate skilled performance as technical tasks become complex and as situations and processes change, reason and solve technical problems,

be strategic, innovate and adapt' (Stevenson 1994, p.9). A wealth of empirical work is available to support this contention within cognitive science, some of it undertaken in this country (e.g. Evans & Butler 1992; Stevenson 1996). Moreover, the cognitive literature furnishes accounts of the knowledge types required for expert performance (Stevenson & McKavanagh 1994; Stevenson 1994). In the current chapter, this literature is used as a basis for appraising assessment practices and the knowledge being assessed through the CBT approach. In the appraisal of the results from this project, it is argued that more uniform assessment practices are in many ways detrimental to the very goals of the national reform agenda that the implementation of CBT was supposed to fulfil.

Assessment of expertise

Derived from the cognitive literature are six critical factors for the development of expertise of the kind Stevenson (1994) advocates, consistent with vocational goals for flexibility and adaptability. Table 5.1 illustrates the derivation of five factors from the work of Stevenson (1994).

Table 5.1: Factors derived from Stevenson's (1994) view of the development of expertise

Cognitive view	Factor
Conceptual understanding	Understanding
Specific skills with ability to perceive indicators of competent performance	Practice
Higher order procedural knowledge such as problem-solving, monitoring and regulation	Authenticity
The capacity to generate original and worthwhile responses to complex and ill-defined situations	Integration
Control over the co-ordination of different kinds of knowledge in new and unfamiliar problematic situations	Complexity

A third kind of knowledge is dispositional knowledge (Prawat 1989). It refers to appropriate dispositions for vocational practice such as attitudes, values, interests and identities. Katz and Raths (1985) define dispositions as 'habits of mind' (cited in Prawat 1989, p.25) because they always occur in functional contexts. Such dispositions are also important in sociocultural views of developing skilled vocational practice as

Table 5.2: Mapping of factors in this study against those for the development of expertise

Factor	Ways in which expertise is developed (Stevenson 1994)
Authenticity	Embedding conceptual and procedural knowledge development in functional contexts with authentic characteristics
Incentive	Focussing more on individual differences, interests, prior knowledge, dispositions and the attributes needed in cultures of practice; giving more explicit attention to affective aspects of vocational expertise
Practice	Developing procedural knowledge in a variety of functional contexts, and using these experiences as opportunities to dis-embed principles as conceptual understanding
Integration	Focussing more on the organisation and structuring of conceptual understanding
Understanding	Making feedback indicators explicit to accelerate progression to expertise, and making explicit the relationships among conceptual understanding, perceptual feedback, skill and progressive development of expert performance
	Moving from teacher-centred information to student-centred active engagement in problem-solving and reflection
Complexity	Providing opportunities for learners to engage actively in deducing/examining these relationships
Practice & integration	Pressing learners into problem-solving themselves

an essential ingredient alongside both knowledge and understanding (Billett 1994). Dispositional knowledge gives rise to the sixth factor, incentive, as another important factor in the development of expertise.

Stevenson (1994) argues that as expertise develops, links are established between conceptual understanding and procedural knowledge. That it is these links that enable the learner to solve new, unfamiliar and complex problems. Stevenson argues that the development of expertise can be enhanced if attention is given to the developmental strategies outlined in table 5.2. The six factors identified above can be mapped against these strategies.

Thus, it can be seen that the six factors identified play an important role in the development of expertise. Each of the factors has been linked to at least one cognitive developmental strategy and can be correspondingly linked to assessment strategies. Table 5.3 illustrates these linkages.

Table 5.3: Critical factors in the development of expertise with illustrations from assessment practices

Factor	Illustration from assessment practices
Incentive	Graded passes (e.g. credit, honours) provide competition and motivation for learners
Practice	Repeated assessment for performance on similar tasks help establish that routine skills needed for adaptability have been developed
Understanding	Conceptual understanding and linkages between concepts and practice are needed for flexibility
Authenticity	The ability to successfully perform in functioning authentic settings provides evidence that an individual is adaptable
Complexity	The ability to successfully perform complex, problematic and creative tasks (as are often required in workplaces) provides evidence that an individual is adaptable
Integration	The ability to draw together knowledge and skills from a variety of perspectives provides evidence that an individual is adaptable

In the Discussion section of this chapter, each of these factors is discussed in relation to the evidence from the study. Where relevant, the factors are also highlighted at the end of each subsection of the Results.

Methods of data analysis

Methods of data collection for the common data set are provided in chapter 3. Data analysis for this chapter is based on responses to 12 items about assessment from this common data set. This analysis is in two phases. The first phase of data accumulation produced a summary from all subjects of all responses on the 12 assessment questions. The second phase analysed these summaries in terms of the six factors (listed in table 5.3 above) which are derived from the cognitive literature on expertise. The summary of responses is presented in the Results section. The analysis in terms of expertise is presented in the Discussion section after the Results.

In the first phase of analysis, responses to 12 questions from the common data set were analysed. The questions, as shown in table 5.4, are categorised in terms of antecedents, processes, outcomes and future directions. Table 5.4 also shows the various groups of respondents.

In the Results section summaries of responses to each question are presented (Questions AA6 and AA7 are combined). Since the issues which emerged from both industries and both States were essentially the same, data from these categories have been combined into a single summary.

Table 5.4: Questions and response groups from the common data set used as the data source for this chapter

Question and category	Response groups
AA Antecedents: Assessment These are questions about how assessment was carried out before CBT.	
Before CBT was implemented:	
AA5 What was your role in assessment?	TAFE teachers, industry and enterprise representatives
AA6 What were the strengths of assessment practices?	TAFE teachers, industry and enterprise representatives
AA7 What were the problems with assessment practices?	TAFE teachers, industry and enterprise representatives
AA8 How were student achievements recognised?	TAFE teachers
PA Processes: Assessment and reporting The next questions are about how assessment changed.	
As CBT was being implemented:	
PA5 In what ways were your assessment practices changed?	TAFE and non-TAFE teachers, industry and enterprise representatives
PA6 How were changes in assessment practices brought about?	TAFE and non-TAFE teachers, industry and enterprise representatives
OL Outcomes: Learning and training (in educational institutions and workplaces) The next questions ask about the ways in which reforms have changed educational institutions and training practices.	
Currently:	
OL8 What evidence is there that learning by trainees has improved?	TAFE and non-TAFE teachers, industry and enterprise representatives
OL9 In what ways are the links between assessment and credentials (certificates) important?	TAFE teachers, industry and enterprise representatives and students
OL10 How does a non-graded pass approach influence motivation to learn?	TAFE and non-TAFE teachers, industry and enterprise representatives and students
OL11 Can you provide examples of how training and assessment practices address the needs of trainees and employers?	TAFE and non-TAFE teachers, industry and enterprise representatives and students
OL12 Can you provide examples of how reliability and validity of assessment are established?	TAFE and non-TAFE teachers, industry and enterprise representatives
FA Assessment: Consider the future of VET beyond current limits	
FA2 How would you change assessment to both improve and acknowledge student performance?	TAFE and non-TAFE teachers, industry and enterprise representatives

The summaries are formed in six steps as detailed below through a process of progressive accumulation of the views expressed by respondents :

1. All responses for the 12 questions have been utilised.
2. Like responses have been drawn together.
3. Where many like responses were accumulated, the responses were further categorised and labels devised.
4. Responses were summarised by paraphrasing and condensing but retaining as far as possible the emphases of the respondents.
5. Progressive summaries were accumulated and condensed to a manageable size and level of generality.
6. As far as possible respondents' actual words were used but, except for direct quotations, the source of these words (in terms of respondent identification numbers) are not retained at the higher levels of summary (called overviews in the results).

The final accumulation of these results is shown in the Results section. The process of progressive accumulation is illustrated below for data from Question FA2 *How would you change assessment to both improve and acknowledge student performance?* The six steps are illustrated in turn below by utilising small samples of data.

Step 1

All responses for the 12 questions have been utilised

All responses to the question from all subjects were gathered together by category. Here is a sample from Queensland metals trainers and employers:

> *Assessment would be on pass/credit/honours system. The pass marks could be raised closer to 65 per cent rather than at 50 per cent. Assessment would be laid out where a portion of the previous work assessed/covered is re-assessed slightly differently to ensure the students competence and ability in applying previously acquired knowledge to the new work. Not just on the learning outcome in isolation. Allow for assessment through the provision of more assignment work carried out under supervision of tutors/teachers at various phases through the courses.*
>
> *Graded assessment.*
>
> *A more holistic approach ensuring various learning outcomes of various modules may be much more effective and productive. We could be much more innovative, but that would require a team approach—dependent on the support of work colleagues.*
>
> *I think we tend to 'over assess', maybe the modules are too divorced from each other, i.e. overlapping in subject area. I would also bring in graded passes—both the students and employers would prefer this.*

Step 2

Like responses have been drawn together

The issues apparent in the above samples are those of grading of results, more holistic assessment, collegiality and over assessment. The latter two issues were later accumulated as 'making assessment more feasible'. Similar accumulations were made for other categories for trainers and employers from Queensland hospitality and Victorian metals and hospitality groups.

Step 3

Where many like responses were accumulated, the responses were further categorised and labels devised

The emergent issues for all four groups were labelled as shown in table 5.5.

Table 5.5: Issues by group arising from Item FA2

Issues	Groups			
	Qld Metals	Qld Hospitality	Vic. Metals	Vic. Hospitality
Grading	✓	✓	✓	✓
Holistic and accumulative assessment	✓	✓	✓	✓
On-the-job assessment	✓		✓	✓
Making assessment more feasible	✓	✓	✓	✓
Training packages	✓			
Other suggestions			✓	

Step 4

Responses were summarised by paraphrasing and condensing but retaining as far as possible the emphases of the respondents

In order to make manageable the voluminous responses, paraphrasing of individual responses and combining similar responses from different individuals was carried out.

Step 5

Progressive summaries were accumulated and condensed to a manageable size and level of generality

Because of the similarity of issues across industry and groups (See, for example, table 5.5), further accumulations were undertaken, firstly by State and then by industry. However the diversity of responses to each of the issues was retained. This process was repeated for other items, since in all cases there was a high degree of uniformity in the issues that arose by industry and by State. (This is not to say that all respondents took the same side on such issues).

Step 6

As far as possible respondents' actual words were used but, except for direct quotations, the source of these words (in terms of respondent identification numbers) are not retained at the higher levels of summary

Condensation of data started with quotations from individuals. However, as the data were accumulated by combining issues from different groups, the words of respondents were reformed to be more inclusive of those with similar views. Except where direct quotations were retained, respondent numbers were dropped because the accumulated text now represented groups rather than individuals. Nevertheless, the voices of individuals are recognisable through the condensed text. The diversity of views surrounding issues was also preserved.

While much of the redundancy in the raw data has been removed in constructing these summaries, differing views from different respondents have been retained, reflecting the data from which the summaries are derived. For example, some teachers were of the view that the assessment of attitudes and values had improved under CBT; others that it had declined, without a consistent pattern by industry, region or State.

Thus the results presented in the next section represent condensed views of all subjects responding to the 12 assessment questions. There is one summary for each of the questions, except that questions AA6 and AA7 are combined (See table 5.4). These overviews are the author's paraphrases from multiple sources. As far as possible, consistent with flow and clarity of written text, the words of the subjects have been used so that the subjects' voices speak through the summaries. At the end of each summary, a commentary is made by the authors to highlight factors (See table 5.3) which are the subject of the analyses in the Discussion section.

Results

AA5 (Antecedent: Assessment) What was your role in assessment?

While there have been central end of year examinations, assessment prior to CBT has been largely set by teachers. There were practical outcomes to perceived standards, guided by the relevant syllabuses, but theory testing was prevalent. While responsibilities rested with individual teachers and there were differences between

individuals, there was also a good deal of collaboration, especially for practical tasks. In Queensland there were also centralised item banks and some attempt at moderation, but large differences across colleges persisted. Assessment was less pervasive and often went into such intangible areas as, for example, the manner of approaching customers in food and beverage service areas.

Commentary on AA5

Assessment was diverse and often through theory examinations, although practical tests and challenges were also used.

AA6-7 (Antecedent: Assessment) What were the strengths and weaknesses of assessment practices?

The results for Questions AA6 and AA7 are presented together in table 5.6 to facilitate comparison of the perceived strengths and weaknesses of assessment practices. The 'issues' of the comparison tables emerged from analyses of the data.

Table 5.6: Summary of all data for AA6-7

Issues	Strengths	Problems
Grading and reporting	Graded assessment was preferred by many teachers, students and employers. Grading (based on percentages) was seen as an easy-to-interpret system that provided a simple overview of achievement and a way of rewarding effort. Exams used to provide percentages and were easy to administer and mark.	Marking exams and tests was subjective and it was difficult to make the fine distinctions between honours, credit and pass. The 'norms' on which the grading was based varied from class to class and it was possible for marks to be adjusted to fit a bell curve. Employers also have a role to play in making judgements about good performance, but often do not want to put in the required effort to do so. With time-framed, end of the year assessment practices, there was less room for students to advance at a quicker pace. Testing was not always available when an individual was ready for an assessment and there were no resits or reassessments.
Reliability and uniformity	Strengths of the old centralised exam system were uniformity (but not necessarily conformity to industry standards) and an ease of monitoring of standards. There was a greater breadth of topics than at present. With College-based Assessment (CBAS) there was more co-operation amongst staff and time to monitor and improve an assessment instrument and maintain a high standard.	Centrally-based exams are open to being skewed by particular examiners and were sometimes very subjective when criteria were not clear. The college-based (CBAS) exam processes were very variable and not always applicable to all colleges. The marking of exams was very subjective with different standards across the State and little effective moderation between colleges. Marking was inconsistent and tended to cause friction. Some teachers assessed well, others poorly.
Learning	With a graded system and holistic assessment, it was easier to encourage good skill development. There was an immediate response time with informal assessment. Students were expected to learn in a set time frame and know more than today's watered down courses under CBT. Standards had to be achieved first time. Instruction which prepared students for a final exam was formal, structured and organised, with a natural progression. It was applicable to both self-paced learning and lock-step modes.	The standards were lower back then. There were fewer failures with 50 per cent as the minimum pass rate. The opportunity for students to build skills was limited because often there was only one opportunity for assessment. Prior to CBT, assessment was not as flexible and students had fewer subjects available to choose from. Too much marking was required.

Table 5.6: Summary of all data for AA6-7 continued

Issues	Strengths	Problems
Learning	Group learning was associated with assessment with students able to see what their peers were doing. People needed to repeat and integrate skills to gain competency at the next level. Study was required before exams. The 'holistic' assessment, with reasonably large chunks of work being assessed, was more relevant than piecemeal assessment. It was an encouragement for broad skilling and problem-solving.	Assessment was input rather than output-based. It was not skills oriented and was more theoretical than practical. There was little class discussion and it was difficult for students to research their own topic. The old system required a lot more pre-planning to teach successfully. There was not enough integrated theory. The system did not cater for slow learners, for fast students or for migrants with English difficulty.
Relevance	The ability to visit work sites as part of the assessment process was a strength. We could focus on an individual's requirements and the CBAS was able to show bias in favour of local requirements. Assessment practices drew from a better skill base overall. It was an holistic approach. There was more discussion with individuals about their needs. There was less, more thoughtful assessment.	One of the disadvantages with centrally set exams was that the strengths of particular examiners sometimes got over-emphasised. With CBAS, there was greater uniformity initially with few teachers involved, but, with an expanding system, as many more teachers and examiners came on stream, there was more variety. This worked against a uniform standard. A problem with the old system was that it did not always assess for aptitude and enthusiasm for employment. Assessment was less related to the 'real world'. Responding to change and the economic climate of industrial needs was a problem. Assessment was not sufficiently flexible for industry.
Overall	Assessment methods were a bit rough and ready to start with and it took a while to develop a good assessment system. It was better overall and included attitudinal/behavioural assessment. The assessment process seemed to work well enough. We thought it was pretty good at the time and we gave a rounded program of training. There was less assessment and there was flexibility in how someone was assessed.	Some respondents could find no strengths whatsoever in assessment practices prior to CBT. Assessment was seen as not as detailed, was not sufficiently related to an audit of skills and did not cover the variety of work. There was not enough questioning of why we were using certain assessments.

Commentary on AA6-7

Assessment was more theoretical, more subjective and more holistic. There were requirements for students to repeat, accumulate and integrate, with knowledge and skills being assessed in relatively large chunks. Grades provided competition and motivation for students.

AA8 (Antecedents: Assessment) How were student achievements recognised?

Both Queensland and Victoria previously used a system of grading (for example, honours, credit and pass). Wages in the following year of apprenticeship and the period of indenture were usually dependent on progress. Teachers and colleges gained reputations in the local area for their standards. Assessment was based mainly on observations through simulated work, with lots of value judgements on the part of the teachers.

Commentary on AA8

Graded assessment, often based on subjective judgements was the norm prior to CBT.

PA5 (Processes: Assessment) In what ways were your assessment practices changed?

The issues identified here emerged from an analysis of the responses from respondents in all categories. Each issue is discussed in turn.

More testing and retesting

The main change after CBT was that the students could retest or relearn and be reassessed. If students wanted to do it on an incremental basis teachers often got caught in a situation where the teacher was just continually testing and wasn't necessarily dealing with achievement of learning. Teachers ended up having to make a new policy on re-tests. There was a lack of uniformity in testing, re-testing (how many opportunities for repeats) and level of achievement. Under CBT students became more aware of assessment processes being used. More work was handed in 'whenever' without adherence to deadlines.

The emphasis with assessment practices has moved to skills rather than conceptual knowledge. Assessment has changed from mainly theory-based with percentage marks, to a combination of theory, practical and observation on the job, taking into account grooming/social/people skills and attitude. Marks are recorded as C (competent) or NYC (not yet competent), or in TAFE as 'J' or 'M'. Testing is aligned with learning outcomes and to a certain degree has become atomised. Implementation of the changes was fairly fast. Previously someone might have a practical assessment in cooking—it would have involved a teacher setting out a range of tasks, strolling around watching what students were doing, making a few notes, but ultimately assessing how good the final product was. Depending on the individual teacher there may be a checklist used. Students involved with CBT are able to repeat until they get it right (within reason). In the normal school system, students get one chance only (unless there are very special circumstances). Students also get confused and like the idea of being able to repeat until they get it right (especially the lazier ones).

Now students must pass all assessment items whereas in the past the results were averaged in the subject. There are more checklists related to learning outcomes and competencies and more reassessments/resits and more record keeping. More testing is carried out, probably too much. More assessment had to be produced for possible repeat testing. There are more frequent assessments as opposed to a build up to a major 'exam'. There is more progressive assessment of individual tasks, and that in itself brought about more reporting and more paperwork. Tracking the status of each student's progress has increased and this can cause mistakes due to the frequency of re-testing. CBT brought a more structured, higher level of accountability and with it greater importance placed on assessments.

The focus is on minute skills, not an overall skills package. It is harder to incorporate worthwhile practical components. There is less marking of exams and more paperwork. There is a greater amount of assessment for smaller chunks of modules—not a bad thing within reason. However under CBT, there are more learning outcomes, undertaken more regularly and this adds greatly to the time taken to assess. We have become obsessed with assessment. Where it is used, a record book completed in the workplace has made the job easier.

Feedback and learning

I can remember my first responsibility as a teacher was to show students how to dismantle a gearbox. We used to call it the bullring system. Whereas now, they literally control their rate of development. The down side to that is it puts a lot of pressure on

individual teachers because instead of a teacher having one subject to teach within a closed environment, they may have as many as 30 subjects. So the initial contact with students is down to the point where he or she comes up and says, 'I have done this to this particular requirement, which is a stated objective and is it okay?' And you would look at it and say, 'No go back and do it again'. And that's all the contact you have. There is very little of that process of imparting the skills that I believe teachers are there for.

On the positive side, CBT made assessment more flexible; in some areas practical and in some areas theory. So it's more about applying the skills rather than just knowing about the skills. That happened pre-CBT but not so formal as now. There is greater feedback to students who are 'not yet competent'. Obviously there is more frequent feedback on achievement. When students are unsuccessful there is more practice, revision and reassessment before moving on to the next task.

Objectivity and computer testing

Assessment is now objective-based against learning outcomes. Before, there was more individual teacher assessment. Now there is more standardisation and automation. Another thing that has happened is that some teaching teams offer most of their assessment via computers, at least in the metals area. This seems to have occurred in teams where teachers are more computer literate and it is the younger teachers who have taken on more innovative approaches to assessment. Theory aspects are now on computer. Instructors don't directly handle paperwork as such with assessment.

Grading

The change to the non-graded system was hard for a lot of people. Our documentation said if they get 80 per cent they pass under CBT. That to me is nonsense because they're not quite sure of what 80 per cent means. To my mind, if you've got learning outcomes and you've got performance criteria which you assess against, then you should be able to demonstrate that the person is performing to those standards. You need to take on board the individual learning strategies so that assessment instruments cater for a multitude of abilities or knowledge or learning styles so that at the end of the day you can say, 'Yes, the person does perform to the standard. Yes they do have those competencies and they are skilful'. CBT is about establishing performances against a standard, not necessarily jumping through a hoop. The assessment system was changed from the honours/credit/pass system to the competent/not-yet-competent system. The system didn't record excellence anymore. Students have to demonstrate that they can perform to a specific standard in order to pass. But it isn't only grading—assessment became outcome oriented or 'criterion-referenced' rather than norm-referenced. Teachers now have to measure the outcomes demonstrated by the student rather than the inputs. Standards have gone up. A pass became 80 per cent instead of 50 per cent. (We still assess by observing but much more closely.) Students are not happy about only 'J or M'—they prefer grades. In some places a graded system has been reintroduced for competency-based assessment, but these innovations are local in scope and not translated to State or national reporting systems.

In moving from standard grades to CBT, there was very little support provided for staff. In the Friday of the last week a kid could finish here and pass with anything over 45 per cent, get a credit with anything over 66 per cent and get an honours with 80 per cent plus. His mate coming in from outside the following week on the first CBT course, according to the information we had, had we taught them in the same way, only the people with honours would be competent. Honours were running in the previous week at about 15-20 per cent of the total students. You didn't have too many

kids with honours. We called it a bell curve in those days. If you looked like getting too many, then you moved the bell. I think that CBT was designed to raise standards. Nobody actually told us that, from now on, we really only want kids with honours standards. That's basically what the educational gurus wanted—we were passing too many kids. The ones at the lower end of the market (coming out with 45% achievement rate) are not wanted. Industry of course can't have that. It can't afford that for every ten chickens in the oven, four and a half are thrown away. Industry wants a 100 per cent pass rate. So I think they were sucked into the idea of CBT—achievement at least 80 per cent of the time.

Criteria

Assessment became criterion-referenced rather than norm-referenced with short assessment items directed to competencies. Instead of an holistic approach to a particular outcome, there is a fair bit of concentration on details of a particular project. This means more involved assessment according to the national standards—identifying smaller parts and then determining the competence of the trainee involved. With more practical assessment it is easier to assess competency. CBT is task/skill driven rather than by exams, with more interaction in class to confirm theoretical understanding. Assessment now has more clearly defined criteria.

Assessment is more formalised now than previously. You formalise it in the fact that you produce handouts for students so they know what they are being assessed on. But we physically do not have the time to actually sit down with the student and go through the criteria one by one. In earlier years there was often another teacher. So we are not only looking after our 15 students but also our customers (in the training restaurant), and that affects the assessment. We still do definitely need assessment but if students can't achieve a certain task then we will ask them to either come back at another time in the restaurant or we will ask them to repeat the subject.

However, when CBT was introduced skills were so clearly defined it was ridiculous. Teachers felt that they had very limited license in how they could assess and the standard required. They tended to believe that what was written in the module descriptor was gospel and there was little freedom. As time progressed they have been able to adapt assessment practices to suit the individual. We seem to have come to a compromise.

Now, every student is required to demonstrate every skill for every competency. Before CBT, this was not the case. We became more critical and expected a higher standard. We now have student learning guides, so the student will come in and he will be organised to level 1, 2 or 3. He has a learning guide on what he has to do and how he has to go about it and spaces to fill in as well. So he then has to go to the library do some research and then we identify what areas he has to look at; it may be computer-based, video, or paper-based research. The completed tasks come back to the instructor to review the work, ask questions in terms of understanding the response, and so do an evaluation. The student will then be allocated a practical area somewhere in the workshop; it may be on a motor vehicle, it may be on a model, or a live model. For example one of the tasks in the automotive area is to dismantle and reassemble an engine. That is very hard if it is the first time you have ever done it; and its unfair to only give them eight hours to do it in. It is very much up to the student to complete the book work and then move into the skill area.

Before CBT students were learning outcomes and performance criteria. There was the standard as well, for example you will dissemble this engine to the standard classifications and there will be no oil leaks. That gave the instructor at least the direction to what was required of the student and it gave the standard. But it was then

up to the instructor; or group of instructors to determine from their learning materials how they would assess that progress. It may be, for example, when the student removes the cylinder head, the standard would be at the conclusion; therefore the outcome basically; at conclusion the engine will start, operate and have no air, water or oil leaks. That is fairly self-evident, if it didn't start then the set outcomes haven't been achieved. If the engine starts and is leaking oil then the set outcomes have still not been achieved. It's one of those practical processes which is reasonably simple outcome-based evaluation. Some others are a little more difficult—say for a manual transmission the student had to dismantle and assemble a transmission. There were some discussions between the instructors as to 'how do we know that they have got all the things in the right place?' The discussion came down to selecting all the gears and the drive must be transferable in all gears. You can't assess a student on what noises may be coming out from the engine because it depends on the condition of the gear box in the first place. You could inadvertently assess someone incorrectly because of the condition of the equipment. So what we did was set up an electric motor which we could put the gear box onto and the student had to prove that he could get all five gears, plus one going backwards with the normal operation of a gear-stick. So it was still outcome based.

On-the-job assessment

We also introduced assessment in the workplace by supervisors or an independent body, but basic things like training in hand tools and welding still have to be done at the college. Once trainees have attained a certain level in welding I can give them the experience in the workplace but the theory should be done at the college. There was an increased focus on specific enterprise needs which enabled/required sourcing of training competencies from a more diverse industry base. This then leads to assessments of broader skills being more specific to the workplace at the workplace.

In food and beverage, it's all remained much the same. If we go from food and beverage to cookery you've got a completely different situation. Before CBT, if they were being assessed on cooking a roast, sauces, or something—before, they would've got a tick for that and at the end you would add up all the ticks and they'd get a mark. Now that's all in separate modules and it's much easier to break the tasks down. By contrast, it's hard to break down waiting on tables—you have to assess the whole thing. It's also hard to break the modules down. We teach several modules together—carrying plates, serving at the table etc. whereas in the kitchen you can teach roasts, and you can teach sauces and so on separately and I'm having a problem asking the teachers to break down their practical tasks into modules. The problem is they need all those things together.

Under CBT assessment is more related to 'real life' situations. But you physically do not have the time to close the restaurant down and go through with each person, task after task, and assess each individual in a time spot. It's coming back to the opening times of the restaurant where there has been a budget where a certain revenue is expected. If the restaurant gets closed of course you don't generate that revenue. So more of an holistic approach is needed to produce competent students.

The other real change is the introduction of RPL. That seems to have taken on more significance since CBT. So now there's more recognition of performance in the workplace supported by documentary evidence. So we see apprentices using accelerated progression relying on work done in the workplace or through other training providers.

Little change

Despite the evidence presented above, a few respondents were of the view that changes are not directly a result of CBT, as in this quote, 'We probably document each

learning outcome assessment more rigorously now, but the practices of assessment have not changed dramatically. Assessment has evolved but not as a result of CBT'. One enterprise representative felt there had been no change.

Commentary on PA5

Under CBT assessment is more related to 'real life' situations, linked to industry standards. The emphasis in assessment practices has moved to skills rather than conceptual knowledge. There is more progressive assessment often dealing with small disaggregated elements. Significant increases in assessment have also been noted in other research, e.g. by Baverstock (1996) and Crump, Connell, Seddon, Currey and Anderson (1997).

PA6 (Processes: Assessment) How were changes in assessment practices brought about?

The issues to emerge from the data relate to the context of assessment, the curriculum specifications, professional development and implementation. Each issue is discussed below.

Context

Assessment practices changed because on-the-job assessment and the competency standards were set by industry, although some teachers believed that their assessment practices didn't change all that much. The national body for metals developed curricula for many different projects as a model and students became more aware of their rights under competency training.

Curriculum

The introduction of new curricula was highly influential in changing assessment through increased specification of learning outcomes and changes in the training environment. Teachers were forced to look at previous assessment practices and try to make them appropriate to CBT through more detailed assessment items. However, before CBT some teachers had already established objective measures to mark against and this has continued. The State training guidelines required outcome results aligned with industry standards and the curriculum committee that works with the metals industry group have pushed this change in the focus of assessment. Similarly the introduction of the Red Training Record Book in hospitality forced changes. The requirement was to do more segmented rather than holistic assessment. The self-paced approach also contributed to this segmentation. More records are needed for audit purposes, so there is more paperwork involved.

Professional development

Obviously the teachers didn't want to change from their comfort zone. They had done all this work on a graded pass system. Why should they change? In the beginning, there was minimal documentation from which to work. There were teachers' meetings and workshops conducted by consultants and senior staff with industry involvement. New ideas were implemented and changes reviewed, but teachers were ultimately faced with a situation, 'This is what you'll do'. Unlike pre-CBT, teachers had to be more sensitive in moderating, monitoring and improving their own assessment practice. There was increased staff development for production of assessment tools, often collaboratively, to align with the new assessment criteria. The audit and review processes forced change. There was a negative attitude by some, especially students, who thought 'why should I do any better because everyone ends up with just a pass?'

The universities also had a negative attitude, because they had looked at the research from overseas and seen how CBT had failed elsewhere.

Implementation

In 1990, the first pilot programs were sent around the schools, colleges and TAFE for the metals area in Queensland. In 1991, 27 trade courses were replaced with just one; trialled in six schools initially. Training delivered at the workplace in lieu of the normal classroom also brought about changes in assessment. Initially implementation was targeted selectively. Change wasn't easy and it was a fairly slow process getting providers to adopt competency-based assessment.

Assessment was decided at a college level with teams of teachers often working collaboratively. All items had to be assessed (e.g. by checklists). The idea was that students didn't pass until every one of the competencies was ticked off. Students demanded to be assessed again if they failed to achieve competence. In some areas there was a lack of discipline in learning and assessment tasks. We ended up giving the majority of students a competency, instead of the 15 or 20 per cent who used to get honours. The moment we gave all a single competency, we demotivated the higher achievers.

Assessment went from the holistic to the very specific. Teachers were writing multiple versions of assessment materials. Also some teachers took the opportunity to adapt assessment to the different learning styles of their apprentices. It was an enormous amount of work re-directing work in the classroom to competencies. More time was spent assessing. The amount of paper was just unbelievable.

It happened pretty fast—that was the perception, but whether that was the reality or not is another thing. It doesn't matter how long you've been told about a coming change—it doesn't sink in until it's here. And so, it seemed that CBT was implemented fairly quickly, when in fact there was probably a lot of build up to that point. It just wasn't noticed by a lot of people.

Commentary on PA6

The requirement is to do more, smaller segmented tasks rather than holistic assessment. The self-paced approach also contributed to this segmentation. More records are needed for audit purposes, so there is more paperwork involved giving teachers less time for development. There is a negative attitude by some students who say 'why should I do any better because everyone ends up with just a pass?'

OL8 (Outcomes: Learning) What evidence is there that learning by trainees has improved?

Positive

All learning outcomes are written down and can be assessed more easily. Having a set of standards is important for learning. Trainees can demonstrate that they are able to complete workplace tasks in line with acceptable national industry practices. Learning has improved because of the structured approach, with specific skills made more explicit. More visuals/resources are provided to facilitate learning with more flexible approaches to learning and assessment. There is increased independence and confidence in learning, especially from groups who have previously had low results at school.

Learning is more practical and contextualised because of training happening in the workplace with focussed career expectations and this helps the trainee to retain the knowledge and skill. Training practices have been modified to suit the workplace. Learning is now more directed to multi-skilling across functional training areas. Some

select groups (e.g. some major hotel chain employees) have very good skills including problem-solving skills. There is a whole range of new skills that have been introduced over the last decade. The increase in skills suggests that trainees have been learning well and the number of trainees still in the industry after ten years is an indication of success.

Trainers are now more accountable. Through hearsay, students seem to have more skills and knowledge over a wider range of processes and skills. One would think that CBT training has improved the level of skills although there is little or no documented evidence of improved learning. The people attracted into our trades in TAFE these days have different academic or their natural abilities. The apprenticeship is so much shorter now (three or four years instead of five).

Negative

While the system is more flexible, learning may be no better than before CBT. There is little evidence that there has been an increase in learning. Rhetoric tends to be the order of the day rather than any proper measurement. CBT can be too broad, giving trainees little knowledge in a lot of areas. Because of economic concerns, there is a shortage of money, staff and equipment to fully train students. Courses are shorter, yet there is much growing up to be done by students in training. Learning by trainees definitely hasn't improved by the way it's currently being delivered. Training needs to be delivered holistically with the component pieces pulled together. There is a loss of the 'broad education' that would allow trainees to get jobs in other places. From hearsay from industry the CBT system is less effective than the old system. We are producing people that cannot think and CBT does not recognise extra effort. Positive attitudes to work are an absolute requirement in industry and are still a problem under CBT. However some students will achieve in spite of the system.

The outcome is different because learning is very impersonal with very limited instructor time available. Many find self-paced learning hard. Opportunities have increased but the standard of tradesman seems to have declined because of the 'narrowing' of training outcomes. Students are able to demonstrate simple skills, such as welding a piece of steel, however they may not be able to build a large project. Trainees may have more application knowledge—'how to do it'—but will they be able to retain the knowledge after a 'once only' required for competency testing?

Commentary on OL8

Learning is more practical (how to do it) and contextualised because of training happening in the workplace with focussed career expectations but there is very limited instructor time available. Trainers are now more accountable. Students are able to demonstrate simple skills, such as welding a piece of steel, however they may not be able to build a large project. There is a loss of the 'broad education' and positive attitudes to work are still a problem under CBT.

OL9 (Outcomes: Learning) In what ways are the links between assessment and credentials (certificates) important?

Trainers and employers

The links between assessment and credentials have always been important and they are no less important now. If a credential is going to lead to employment, then it is powerful. The certificate provides evidence that the apprentice is qualified to work in the industry. A qualification is based on the person's ability to meet the competency standards, making a qualification more reliable in terms of the skills the holder is supposed to possess. It's important to make sure that the person has the skill before they are awarded the qualification. So the assessment needs to be focussed on

outcomes. Assessment is important because pay is affected by the completion of modules. It's not just time served. There's also a measure of accountability. You know that if someone gets through they can be credited with actually having the skills. Some believe the assessment practices are more rigorous now. However, others believe that when you add in the re-sits and/or supplementaries, you get about the same fail rate.

Employers benefit greatly from a fully trained person as they can introduce new ideas into the business. It is quite short sighted to consider only those skills for which there is an immediate need—this won't help you grow the business. For example the food we prepare today is very different from what we prepared 10 to 15 years ago. The style of cuisine changes on a very regular cycle—so you need people who have the skills to do both the old and the new and draw from the old to create tomorrow's new. Although some modules have limited direct application to the workplace, the broader skills are of advantage to solving problems on the job. Employers are becoming more critical and many now want *soft skills* like customer service in addition to technical competencies. Whereas some individuals are quite happy to stay in the same job until retirement, it may be important for everyone to be exposed to all aspects of the trade.

Getting recognition for a particular knowledge or skill element in a module as a competency is generally sufficient but some employers have difficulty interpreting a non-graded result. Students see the mark as being important—they line up to see whether they've passed. Students need continual feedback. Under CBT you can only tell them 'you're doing very well'. And I think that's not good enough. They need some evidence that they're doing well, that they're on track—otherwise it's demotivating. Also it should be possible to enrol in small units of competence, and then, when these are achieved, students should be able to apply for an appropriate certificate if they so desire.

Students

The students' view of the link between assessment and credentials reflects those of trainers and employers in many ways. Table 5.7 summarises the student responses, with differences by industry area and State attributable mostly to small sample sizes. Overall students saw the link between assessment and credentials mostly in terms of incentives for learning (15%), the recognition that certificates bring (41%) and continuing or enhanced employment prospects (22%).

Commentary on OL9

Students see strong links between grading, motivation and employment. Employers benefit greatly from a fully trained person as they can introduce new ideas into the business and not just those skills for which there is an immediate need. Broader skills are of advantage to solving problems on the job and many employers are becoming more critical and want soft skills like customer service in addition to technical competencies.

Table 5.7: Summary of student responses to Question OL9—In what ways are the links between assessment and credentials (certificates) important? Numbers of responses (and percentages) by category

	Queensland				Victoria				Two States	
Category	**Metals**		**Hospitality**		**Metals**		**Hospitality**		**Total**	
No links	3	(6)	1	(1)	3	(9)	0	(0)	7	(4)
No reason given	2	(3)	5	(6)	1	(3)	2	(33)	10	(6)
Grading	9	(19)	6	(8)	5	(15)	0	(0)	20	(12)
Incentives	6	(13)	13	(17)	4	(12)	1	(17)	24	(15)
Certification	15	(32)	30	(38)	19	(56)	3	(50)	67	(41)
Employment	12	(26)	23	(29)	2	(6)	0	(0)	37	(22)
Total	**47**	**(100)**	**78**	**(100)**	**34**	**(100)**	**6**	**(100)**	**165**	**(100)**

OL10 (Outcomes: Learning) How does a non-graded pass approach influence motivation to learn?

Trainers and employers

Non-grading of results is perhaps the most criticised aspect of CBT, but even here there are differing views, expressed this way by a trainer:

> *We have two categories of students: those who are very happy with being competent; and those who dislike a 'J' because they want to proceed beyond the base requirement—their motivation falls.*

As exemplified by the following quote, a few trainers and employers thought that non-graded passes were a good thing:

> *The pass in CBT is equal to 80 per cent in past assessment, and therefore should be seen as an achievement in itself.*

However the overwhelming majority of trainers and employers saw non-grading as demotivating:

> *The 'J' mark given by TAFE is of no value to me when I interview pre-voc's wanting a job here. I've told the TAFE how can I tell who's the best lad when 20 of them turn up with a 'J'. When I interview them now I find out about their attitude and make my decision mainly on that. I know that they have some skills from the pre-voc course. Also, when my apprentices come back from college they all get a 'J', so I have to ring the college and ask the teachers how they went if I want to know. Now that I see more of them I can ask them when they're here. I know the lads don't go much on getting a 'J', particularly the good ones. They don't see any point in putting in the effort at college as they are going to get the same mark as everyone else. In my day you got extra pay for getting the highest mark so the good ones really tried.*

Although good people will always try hard, non-grading demotivates many good students. It encourages mediocrity and is a major fault of the system. Many have the attitude, if 50 per cent is a pass 51 per cent is a waste of effort. Students tend to aim at basic competency levels as opposed to their highest ability. This depresses the motivation to learn in competitive students, while encouraging students who normally struggle with their work. Superior performance needs to be recognised. Extra effort needs to be rewarded by a higher mark. Although it is not reported centrally, some teachers have introduced their own grading system, as in this example:

> *Many students ask 'how competent am I?' and industry wants to know. I introduce some level of grading and competition into my assessment to identify excellence.*

Other trainers and employers felt that non-grading had both benefits and problems:

> *A non-graded pass effects good and poor students variously. Good students are demotivated because effort is not recognised. On the other hand lower achieving students felt encouraged by the recognition gained by completion of units of work rather than being discouraged by failure or low grades when judged against high performing peers.*

Students

Students also reported that non-grading was an issue, but were more evenly divided between its benefits and problems than were trainers and employers, with 40 per cent of students overall finding non-grading agreeable and 48 per cent finding it demotivating or preferring grading. Of those who responded 12 per cent were neutral. Table 5.8 presents these results.

Table 5.8: Summary of student responses to Question OL10: How does a non-graded pass approach influence motivation to learn? Numbers of responses (and percentages) by category

	Queensland				Victoria				Two States	
	Metals		Hospitality		Metals		Hospitality		Total	
Agreeable	13	(22)	50	(46)	28	(50)	4	(29)	95	(40)
Neutral	4	(7)	12	(11)	10	(18)	2	(14)	28	(12)
Demotivates	27	(45)	35	(32)	6	(11)	2	(14)	70	(29)
Grading is better	16	(27)	12	(11)	12	(21)	6	(43)	46	(19)
Total	**60**	**(100)**	**109**	**(100)**	**56**	**(100)**	**14**	**(100)**	**239**	**(100)**

Commentary on OL10

The overwhelming majority of trainers and employers saw non-grading as demotivating, although students were more evenly divided. However, it was agreed that in general the effects of non-grading were varied. Good students were demotivated because extra effort is not recognised. On the other hand lower achieving students felt encouraged by the recognition gained by completion of units of work rather than being discouraged by failure or low grades when judged against high performing peers. (It should be noted that New South Wales and South Australia have been using a system of graded competencies and that most systems have initiated reviews and introduced pilot projects to test various forms of graded supplementary reporting. David Rumsey et al. (1997), Collins (1993) and Thomson, Mathers and Quirk (1996) provide further information.)

OL11 Can you provide examples of how training and assessment practices address the needs of trainees and employers?

Trainee needs

Assessment now is done on each learning outcome with more individual assessments within self-paced modules. Assessment is 'black and white', so students can see exactly what they have to do. Should a student fail one outcome they simply repeat that outcome. Some sections have a variation on the number of attempts a student may take, with counselling offered between attempts. However, the small size of modules tends to make assessment a rushed affair with little opportunity for feedback, discussion or further investigation. There is now less focus on 'tests'. Verbal assessment, diagrams, demonstrations and the provision of English translators are a few of the wider variety of forms of assessment offered. These can help overcome numeracy and literacy problems and make it easier for low ability students and those who are nervous or lack self-esteem. Computer-based assessment allows students to test when they are ready. Assessment can be more flexible for employers too with in-house assessments tasks related to the job, and ongoing testing in both theory and practical areas on the job. Employers can influence the timing of assessment so that, for example, it ties in with retraining needs in employment. However, employers are asking for greater indications of the motivation for students to achieve competency.

Employer needs

The focus is on demonstrated competence in action rather than memorisation or articulating what is to be done. Competency-based assessment is more closely linked to 'real life' situations of work as defined in the national standard, opening greater employment opportunities as indicated by high levels of graduate placements in, for example, hospitality in Victoria. Learners' needs are not the first consideration. The

assessment practices of self-paced, on-the-job etc. tend to pander to the needs of the industry and meeting audit requirements. Employers are the winners because the training they are accessing for their workers is more customised—it's more focussed on specific workforce needs. It becomes possible and practical to rearrange/restructure the assessment materials to suit specific enterprise work task plans. Other examples come from the mining industry. In the School of Mining in the college, a large number of modules in mining courses have been designed specifically to meet needs for mines in the region and have been adapted to be used interstate and overseas. In another example of a new refinery operation, the college helped that organisation develop enterprise specific modules. These modules became nationally endorsed descriptors and refinery staff were trained using those descriptors. This is one example where the training and the assessment for the trainees were very much on-site using normal day-to-day production procedures. So it was all designed from the beginning to meet employer needs and it definitely fulfilled those needs. Such customisation has been extended in national Training Packages.

It is a common view that because so many different representatives are involved in designing competency standards then these represent a comprehensive set from which specific regional training needs can be addressed. These competency standards are supposed to define the skills and practices and the performance of those practices that are relevant to a range of industries. For example, the metal trades competency standards are very broad. With different enterprises, the needs will be different, but the competency standard can still cover for that. What is needed are competency standards which are not too prescriptive so as not to cut out the flexibility. However there are still topics that haven't been adequately addressed. For example, in hospitality there's a giant hole in Asian cooking (although this will change under the new Training Packages). There are thousands of restaurants serving Asian food, but there are virtually no courses in Asian cooking because apprenticeships are fundamentally about European cooking. Everyone across the country now has to do basically the same assessment. But you can't say a boilermaker or electrician on the job does exactly the same thing all day every day. There's a lot of commonality but it is not identical.

While workplace assessment is common, simulations and role plays (e.g. in a training restaurant) provide an opportunity to practice in a safe environment, followed by observation and participation on the job. This gives students the underpinning knowledge and confidence to operate within the work environment. A good example is apprentice chefs who learn total buffet preparation fairly early on, so they can test out of the course in buffet preparation at college. This saves time for the apprentice and both time and money for the employer. However, just because students did it at college in ideal conditions doesn't mean they can do the job. How many times should they be able to do it before they become competent?

Assessment does not uniformly suit the requirements of all establishments, is very time consuming to administer and the kind of incentive to perform that is present in examinations is removed. Assessment practices sometimes focus on narrow skills out of context. By some assessment is regarded as laughable and well below the standard of what is actually done at work. Some important aspects of performance, for example 'teamwork', are not adequately reflected in the standards and so in the assessment tasks. The result is a dominance of 'imitatory elements' which fail to recognise the interrelationship and interdependencies between competencies and the strategic importance of collaboration in the workplace.

Students

While students provided few actual examples, most (88%) felt that their needs were addressed because their knowledge was expanded or they could do their job better as a result of assessment as summarised in table 5.9.

Table 5.9: Summary of student responses to Question OL11— Can you provide examples of how training and assessment practices address the needs of trainees and employers? Numbers of responses (and percentages) by category

	Queensland				Victoria				Two States	
	Metals		Hospitality		Metals		Hospitality		Total	
Needs not addressed	8	(21)	6	(9)	3	(12)	0	(0)	17	(13)
Knowledge expanded	14	(36)	5	(7)	6	(24)	0	(0)	25	(19)
Do the job better	17	(44)	57	(84)	16	(64)	3	(100)	93	(69)
Total	**39**	**(100)**	**68**	**(100)**	**25**	**(100)**	**3**	**(100)**	**135**	**(100)**

Commentary on OL11

Assessment under CBT can be more flexible and customisation has been further extended in national Training Packages. However, the small size of modules tends to make assessment a rushed affair with little opportunity for feedback, discussion or further investigation. Assessment practices tend to pander to the needs of the industry and meeting audit requirements. Assessment practices sometimes focus on narrow skills out of context, although many students felt they could do their job better as a result of assessment. Because of the requirements to meet prescribed standards everyone across the country now has to do basically the same assessment. But there is a good deal of variation in actual jobs. Some important aspects of performance, for example 'teamwork', are not adequately reflected in the standards and so in the assessment tasks. The result is a dominance of 'imitatory elements' which fail to recognise the interrelationship and interdependencies between competencies and the strategic importance of collaboration in the workplace.

OL12 (Outcomes: Learning) Can you provide examples of how reliability and validity of assessment are established?

There was much confusion and irrelevant information provided in answers to this question. Perhaps the concepts of reliability and validity are ill understood, particularly in relation to CBT. Yet these are key concepts in maintaining and improving the quality of assessment. Of the responses aligned to the question, there were many unsubstantiated claims of reliability and validity. Implementation of processes which were used to achieve reliability and validity were advanced. Only two indicators of improvement in reliability and validity were explicitly mentioned whereas problems were often cited. Each of these categories of response is discussed below.

Unsubstantiated claims of reliability and validity

The claims made by respondents are listed in the following dot points and speak for themselves:

- We don't really measure reliability and validity, but I expect competencies to have valid high validity.
- I don't know whether I would call it better, but teachers are more mindful of outcomes and objectives.
- Objectivity of assessment afforded by 'industry standards' increases reliability.
- Assessment is valid because it is current and can be quickly updated.
- Consistent learning across the board is a benefit.

Procedures to help ensure reliability and validity

The same computer-based test is used by all staff in every class for a module and exams produced and held centrally (in the college) contribute to reliability. Where the same self-paced modules are used consistently across town/State, with their in-built assessment, then reliability of results across trainer's systems may be achieved. Skills checklist and standards (time frames etc.) to be achieved are produced and resit procedures etc. specified. Each practical outcome is assessed against set criteria i.e. tolerance, size, appearance etc.

The 'Black Book' standards for hospitality in Queensland are reflected in assessment outcomes in line with industry. Whereas before CBT teachers could put their own slant on things, now they pretty much go by the book. Assessment in food and beverages areas is a combination of theory and practical, and grooming and attitude. Having industry input into the design of assessment was seen as improving authenticity and validity. Workplace assessors were also cited as improving reliability and validity, as in the following example:

> *In terms of assessment we went down the path of originally training 16–17 workplace assessors giving them formal training and skills in that area. We have now gone away from using that number of assessors to using one assessor so we have really narrowed the ability for discrepancies in assessment etc. where we have one particular guy who we actually advertised a position for a workplace assessor. This guy had to meet a number of criteria, he had to be respected by his peers, he had to be respected by his supervisors who previously did the assessing and he had to be trained, he had to be competent, subject matter expert in everything assessed. So what that does, it creates a very rigid and stringent assessor who is respected by all and conducts each assessment basically the same.*

Processes for improving reliability and validity of assessment such as moderation and feedback from industry personnel and Program Quality Teams were also cited, although the expense of implementation limited the use of these procedures. Audits by ITABs of Registered Training Organisations (RTOs) which can be carried out at any time are also helping to address validity and reliability problems of assessments. Others felt that the audit process isn't terribly good because it's mostly an audit of teachers' skills through interviews with students and employers. But overall it's not a very structured process of audit. There is a desktop audit evaluation of any handouts etc. used by the teacher.

Indicators of improved reliability and validity

In the metals area in Queensland for refinery operations and workplace safety, good performance on simulators and improved safety record at work were cited as evidence for the validity of training. High levels of employment of trainees was given as an indicator of validity in the hospitality industry in Victoria.

Problems of reliability and validity

Many difficulties of achieving reliability and validity were raised. For example, the increase in time spent on record keeping has decreased teacher's capacity to attend to issues of reliability and validity in assessment. To meet increased workloads assessment items were often designed quickly and were often therefore of suspect quality. Reliability and validity under CBT are no different from reliability and validity under any other training system. It depends on the integrity of the assessor.

The differences between performing in a workshop and on the job also contributed to the difficulty of establishing reliability. In most cases students perform a task only once for assessment making it difficult to establish reliability because reliability is fundamentally about consistency. The lack of industry standards, especially in the early days of CBT implementation also meant that benchmarks against which validity could be gauged were not readily available.

Where computers were used to administer assessment, there were cases where all answers were similar indicating collaboration amongst students on what was supposed to be individual testing. The new on-the-job assessment will be a big issue, with conflicts of personality etc. Students tend to do the assessment item for the 'tick' and then once they get it, they forget about it. Traineeships are good as they give trainees time to get it right. The assessment process is too focussed on the technical skills and does not cover the 'common sense and personality skills'. With more practice, students will pass assessments—they must be given enough time to practice tasks. The reliability of assessment has been downgraded to the skill component only, and not to a knowledge base. Practical assessment under CBT is seen as easier than assessment of theory but perhaps theoretical subjects also need to be formalised in CBT. Current assessment is useful for manual tasks but not good for attitudinal and educational requirements.

Commentary on OL12

Having industry input into the design and moderation of assessment improves authenticity and validity. Workplace assessment can also be valuable. However, the emphasis on conformity to standards and consistency in assessment often means that assessment overemphasises the skill component at the expense of a broader knowledge base.

FA2 (Future directions: Assessment) How would you change assessment to both improve and acknowledge student performance?

Grading

While not universal, a return to a graded system was strongly supported by many teachers. For example a return to the graded system on certain modules or subjects to give the students something to strive for by going back to a system that encourages and rewards excellence was advocated. 'J' is demotivating to many. More certification/awards for excellence need to be considered Assessment should be on a graded pass/credit/honours or a percentage system. The pass marks could be raised closer to 65 per cent rather than 50 per cent. Grades give employers some idea of the level achieved. Students prefer them too. Try to implement a system in which the student can be graded after competency has been achieved. A graded system might improve motivation, but others were not sure and would like to see more research done on graded competencies. One employer explained the problem as he saw it:

> *We've got to get rid of that 'J' business. Their assessment papers go to our town office and they used to send them to me. I've told them not to bother—just file them—they have no meaning to me. I think there should be credit and honours—I got honours and that made you feel good and made you try. As a result I won a prize one year—that's something I've always had and always got. So there should be degrees of competence. Common sense has got to prevail; it seems that everyone passes today. That's because they keep trying till they get it—I don't think that's right. If they failed some attempts that should be on their certificate so I know how long it took them to learn. I don't look at these trade papers anymore; I just check a couple of references and put them on a week's trial.*

Students could be ranked according to how easily and quickly they achieved the competency. For example, someone who performs a task well and demonstrates competence at it first time around, and well, ought to be ranked higher than someone who took four turns to demonstrate competence. The number of times that a trainee has been tested to gain a competency should be recorded on the certificate or limit the number of times within the traineeship period a trainee can be assessed in a competency.

The latest legislation (freedom of information etc.) makes it difficult for us to do CBT and yet still fully report the students' ability level. It would be nice to say, yes, Jimmy is competent, but he needs this, this and that. But under 'freedom of information', James, Jimmy and Fred all have the right to see what we have said about the other people in the same group and so we end up saying all these people have a 'J' and we really can't qualify that statement. So I would like to change it, but I would have to change the law so we can actually make comparative statements if we have to keep CBT. There are good reasons for keeping CBT, but not in the area of comparison of individuals. I think students would probably put up with CBT if they thought their extra efforts were in some way acknowledged. Or the lack of extra effort in other people was in some way downgraded. They actually want to show that the slackers are slack.

Holistic and accumulative assessment

CBT is good in that it is continuous with detailed learning outcomes. It still does need a combination assessment of multiple learning outcomes at times. Students need to be assessed in a number of ways—practical, theory, oral and demonstration. Learning outcomes could be changed to make them more practical with separate theory and practical marks.

We need less small assessments and more global assessments especially in the areas of supervision and interpersonal skills. Assessment should be laid out where a portion of the previous work assessed/covered is re-assessed slightly differently to ensure the student's competence and ability in applying previously acquired knowledge to the new work—not just on the learning outcome in isolation. Allow for assessment through the provision of more assignment work carried out under supervision of tutors/teachers at various phases through the courses. We should have major examinations on large sections of work, not small bits. Have project-based assessment at the completion of a set number of modules. Further enhance a form of work to recapitulate on the subject matter, modules etc. Reintroduce exams which apprentices need to do at the end of each year. At the moment they only have to pass a task once and it is never retested.

Maybe the modules are too divorced from each other. A more holistic approach covering various learning outcomes of various modules may be much more effective and productive. We could be much more innovative, but that would require a team approach—dependent on the support of work colleagues. Units of competency within the Training Package would provide a chance to link subjects together and reduce the number of assessments. An ongoing assessment throughout their training with a generalised end of period revision and test should happen. A generalised test of the last 12 months perhaps. Practical application is what is needed. Other solutions raised were to test later or over a period of time to monitor increase of performance, rather than marking as a once off.

On-the-job assessment

It is claimed that on-site delivery would improve assessment practices. Testing of specific tasks should be done as part of a real job as it would occur in the workplace. For example, once they've been tested on a master cylinder they never have to be

tested again even if working on a master cylinder is part of a bigger job. Also when a job is done the piece of equipment should be tested to make sure that it really works and that the motor vehicle could be driven away by an owner at the end of the day.

In engineering, assessment is needed that is related as closely as possible to a task in the workplace so trainees can appreciate that a task is done for a real purpose and at a standard that industry demands and expects. Assessment in the workplace is where we should be heading so that industry can take a greater degree of responsibility for its own training. Workplace assessment is needed so the trainee can see that their employer can sell the product made by the trainee, particularly in the construction area where there are life-sized products. Just because you learnt it in college doesn't mean you can do it at work. There's no pressure on the bloke at college. At work, he's got the boss on his back—we quoted on the job and it's about doing it with quality and within the timeframe. What would give a truer assessment would be to test under work conditions. So quality welding and learning to weld need to be taught and tested at college. As far as assessing them or giving them a result, it needs to be done on an industry basis in collaboration with the employer who could say, 'He took five times as long—the job is a perfect job—but I've lost money on it'.

Where possible, assessment should be done to industry standards, with saleable products but there is a problem in the engineering area. We had students build car ramps, but under the advent of litigation processes, people became concerned about the quality of welds. It was a reasonable assumption that there may have been substandard welds, because they were done by trainees.

Making assessment more feasible

A major issue has been trying to implement CBT within traditional structures (of TAFE) which have too many restructures. Better funding would facilitate improvements. We tend to 'over assess'. Less paperwork would be a step in the right direction. A change to computer tests with lesser testing may be more resource efficient. Assessments are a little subjective. More oral and more observation type testing would be better. They're still formal because you have objectives that must be met, but I'd like to see clearer objectives and more criterion-based assessment. Assessment needs a new approach to timetabling which should improve assessment if handled imaginatively, i.e. reduce the number of assessments, but deepen those which are done. Further enforcement of safety issues as a component of the competency outcome is needed. There's always room for improvement.

Training Packages

With the introduction of the new Training Packages (engineering packages are not yet available) and the introduction of workplace assessment practice, teachers will need to look at their assessment practices again and the signing off on competencies in the workplace. If the college teachers are going to assess on the job they are going to have to get to industry on pretty short notice to assess as the jobs are carried out. In this some want the college to take charge of assessment and not be used only as an independent assessor.

For the engineering area (MERS ITAB), workplace assessment is required with MERS accredited workplace assessors. If industry has a workplace assessor then that assessor will carry out that assessment in the workplace particularly for the more practical tasks. That information will be relayed back to the RTO and together with the assessment of the underpinning skills and knowledge the total unit of competence will be signed off. If the workplace doesn't have an accredited workplace assessor then I believe that the RTO will have to provide the assessor. Logistically it will be difficult for training providers

such as TAFE. Part of our limitation there is our industrial award. It is not clear how we can flexibly assess in the workplace and meet our client needs.

Other improvements

Other changes which were seen as improving assessment were:

- introducing common task assessments
- setting up standard recognition bodies that all students must go through to obtain final recognition of performance
- having trainee groups present material from across a number of different completed modules to give them the opportunity to share what they have learned
- making student information booklets in the theory area align more with theory tests

Commentary on FA2

Grading or ranking of students are important to motivation, particularly for better students. Assessment needs to be more holistic and accumulative and include soft skills like interpersonal relations. On-site delivery and assessment in authentic practice is valued, but teachers need to be able to spend less time on auditing requirements and more on improving quality. Training Packages may provide greater opportunities for customisation and authenticity.

Discussion

As argued earlier in this chapter, expert workplace performance involves deep conceptual understanding, well developed routine procedures and the ability to be flexible, creative and adaptable in the face of new endeavours, problems and change. It has also been argued that at least six factors which are of critical importance in assessing expertise include having learners who:

- are motivated
- have well developed routine skills
- a deep understanding of what they are doing
- are capable of engagement in complex tasks
- are capable of operating in a variety of authentic settings
- can integrate their knowledge and skills to achieve adaptability

This section compares the evidence from the Results section above against those six factors in order to appraise assessment practices under CBT. In this appraisal, each of the six factors is examined in turn. Table 5.10 outlines which parts of the Results are most used in examining each factor.

Incentive

The assessment issue that provoked the strongest response from students, teachers and industry representatives was that of the non-graded pass. Replacing a grading system (usually Honours, Credit, Pass, Fail) with a pass/fail system (Competent or 'J', Not yet competent or 'M') was a major change with the implementation of CBT. The issue is coupled with that of motivation for learning and performance. Learning, especially for complex abilities involved in developing expertise, occurs more easily when learners are motivated. Of course, motivation was not always linked to grades, as for this non-TAFE trainer:

Table 5.10: Factors and main sources for appraising assessment practices

Factor	Main source question and subsections from the results
Incentive	AA6-7 Grading and reporting AA8 *No contribution from these questions* PA5 Grading PA6 Professional development OL8 Positive; negative OL9 Trainers and employers; students OL10 Trainers and employers; students OL11 Trainers and employers FA2 Grading
Practice and understanding	AA5 *No contribution from these questions* PA5 More testing and retesting; feedback and learning; grading; criteria PA6 Implementation OL12 Problems of reliability and validity FA2 Making assessment more feasible
Authenticity	AA6-7 Relevance; overall PA5 On-the-job OL11 Trainers and employers FA2 On-the-job; other improvements
Complexity	OL8 Positive OL9 Trainers and employers OL11 Trainers and employers FA2 Holistic and accumulative assessment
Integration	AA6-7 Learning PA5 On-the-job assessment PA6 Curriculum FA2 Holistic and accumulative assessment

We have no difficulty with student motivation, not because of grades, but because of the relevance and purposes of training, which are related to workplace change processes.

Nevertheless, assessment and reporting processes that provide incentives are powerful in promoting the development of expertise.

Graded assessment, as was common prior to CBT, is preferred by many teachers, students and employers. Both Queensland and Victoria previously used such a system of grading. Grading (based on percentages) was seen as an easy-to-interpret system that provided a simple overview of achievement and a way of rewarding effort. Exams used to provide percentages and were easy to administer and mark. However, marking exams and tests was subjective and it was difficult to make the fine distinctions between honours, credit and pass. The 'norms' on which the grading was based varied from class to class and it was possible for marks to be artificially adjusted to fit a bell curve. With time-framed, end of the year assessment practices, there was little room for students to advance at a quicker pace because testing was not always available when an individual was ready and there were no resits or reassessments. Assessment also involved observations through simulated work, necessitating judgements by the teachers against ill-defined criteria. Wages in the following year of apprenticeship and the period of indenture were usually dependent on progress with accelerated progress possible for outstanding performance (although accelerated progression under CBT is a compensating factor). Teachers and colleges gained reputations in the local area for their standards.

With the introduction of CBT the forced change to a non-graded system was difficult for a lot of people. The system didn't record excellence anymore. Students have to demonstrate that they can perform to a specific standard in order to pass. Obviously

the teachers didn't want to change from their comfort zone. They had done all this work on a graded pass system. Why should they change? In the beginning, there was minimal documentation from which to work. There were teachers' meetings and workshops conducted by consultants and senior staff with industry involvement. New ideas were implemented and changes reviewed, but teachers were ultimately faced with a situation, 'This is what you'll do'. The effect of non-grading on many was demotivating, as this industry trainer reported:

> *There was a negative attitude by some, especially students, who thought 'why should I do any better' because they all end up with just a pass.*

Once CBT was established, the incentives provided by the system in terms of motivation for some groups of students was recognised by some teachers. A non-graded pass affects good and poor students differentially. Good students are demotivated because effort is not recognised. On the other hand lower achieving students felt encouraged by the recognition gained by completion of units of work rather than being discouraged by failure or low grades when judged against high performing peers. There is increased independence and confidence in learning, especially from groups who have previously had low results at school. However teachers for the most part were adamant that non-graded assessment was demotivating on students and reported that employers are asking for greater indications of the motivation for students to achieve competency.

Students also reported that non-grading was an issue, but were more evenly divided between is benefits and problems than were trainers and employers, with 40 per cent of students overall finding non-grading agreeable and 48 per cent finding it demotivating or preferring grading. Of those who responded 12 per cent were neutral (See table 5.8).

> *On the question of future directions, a return to the graded system was advocated to give the students something to strive for by going back to a system that encourages and rewards excellence. 'J' is demotivating to many. More certification/awards for excellence need to be considered Assessment should be on a graded pass/credit/honours or a percentage system. The pass marks could be raised closer to 65 per cent rather than at 50 per cent. Grades give employers some idea of the level achieved. Students prefer them too. Try to implement a system in which the student can be graded after competency has been achieved. A graded system might improve motivation, but others were not sure and would like to see more research done on graded competencies.*

Other improvements suggested were that students could be ranked according to how easily and quickly they achieved the competency. For example, someone who performs a task well and demonstrates competence at it first time around, and well, ought to be ranked higher than someone who took four turns to demonstrate competence. The number of times that a trainee has been tested to gain a competency should be recorded on the certificate or limit the number of times within the traineeship period a trainee can be assessed in a competency.

Thus, non-graded passes are seen as demotivating by many students (and especially better students), teachers and employers, whereas what is required to develop expertise are high incentives to commit to learning.

Practice and understanding

Routine procedures are required for expertise (Stevenson 1994). They are acquired and developed towards automation through repeated application and can be demonstrated as practised skills. Expertise, however, also relies on understanding. Knowledge of situations and of linkages between components provide the

understanding of when and where practiced skills should be used or when known skills are inadequate for the job at hand. In the context of this study the knowledge of understanding is commonly referred to as theory or conceptual knowledge and the knowledge of skills as practice. Since both are spoken of together (often as contrasts) they are discussed together in this section.

Prior to CBT both theory and practice were given importance in teaching, although theory often overshadowed practice in assessment. Theory examinations set from shared item banks dominated. Responsibility for assessment rested with individual teachers, although there was also a good deal of collaboration, especially for practical tasks but large differences across colleges persisted. Assessment was less pervasive and often went into such intangible areas as, for example, the manner of approaching customers in food and beverage service areas.

After CBT the emphasis moved to skills rather than conceptual knowledge. There are more frequent assessments as opposed to a build up to a major 'exam'. Assessment has changed from mainly theory-based, to a combination of theory, practical and observation on the job, as a hospitality enterprise representative illustrates:

> *I guess the difference in assessment is more to do with they are looking for; the application of the modules more so than just the ability to replicate. So it's more about applying the skills than just knowing about the skills. That happened in my day but not to the formal extent it happens now.*

Testing is aligned with learning outcomes and satisfactory testing on all outcomes, rather than through sampling or averaging across good and bad performance, is generally required. As a metals teacher in TAFE explains:

> *To my mind, if you've got learning outcomes and you've got performance criteria to which you assess against then you should be able to demonstrate if the person is performing to those standards. You need to take on board the individual learning strategies so that your assessment instrument caters for a multitude of abilities or knowledge or learning styles so that at the end of the day you can say, yes the person does perform to the standard, yes they do have those competencies and they are skilful. CBT is about establishing performances against a standard, not necessarily jumping through a hoop.*

Students can retest or relearn and be reassessed, but once tested satisfactorily, are not often required to continue to practise further or integrate with other learning. Students tend to do the assessment item for the 'tick' and then once they get it, they forget about it. There has been a narrowing of learning, which to a certain degree has become disaggregated:

> *There's been a strong switch from 'education' to 'training' and a very strong focus on the workplace. The continuum of training hasn't been addressed—we tend to atomise training under CBT.*

Thus in moving to CBT the outcome has been a de-emphasis on theory and a re-emphasis on practice in assessment. While there is added opportunity for students to develop routine skills, the limited opportunities to reapply and extend those skills in combination with theoretical concepts is of concern. With the emphasis on more easily specified technical requirements, less tangible aspects of assessment such as attitudes and 'common sense' get neglected. Expertise with adaptability requires deep understanding that enriches connections between theory and practice. Traineeships and other forms of work while learning give trainees time to get it right as well as extending what they know.

In suggesting future directions for the development and assessment of expertise, less assessment and less paperwork would be a step in the right direction. While this would lower the level of detail in auditing and accountability, it would allow a broadening and deepening of assessment tasks and permit a re-emphasis on theory and its contribution to performance.

Authenticity

A powerful idea underlying off-the-job vocational training is that learning can be transferred from the setting in which it is learned to that in which it is needed to perform work. This transferability is also important in moving from job to job and for extending a job. The ability to successfully perform in a such variety of ways and settings, especially rich variable settings, provides evidence that an individual is adaptable. Thus another key indicator of expertise is the ability to perform in a range of authentic settings, such as workplaces. This ability can therefore be used as a basis for assessing expert performance. This section examines performance in such vocational settings before and after the introduction of CBT, and explores possible future scenarios.

For antecedents the main evidence is summarised in the Results for Question AA6-7 under the headings Relevance and Overall. For changes to assessment as CBT was implemented PA5 *On-the-Job Assessment* is the most relevant section. For outcomes from the implementation of CBT the sections on *Employer Needs* from question OL11 is pertinent. For future options the *On-the-Job Assessment* section of FA2 which asked about how assessment practices ought to be changed summarises the main evidence.

Before CBT, assessment was more centred on examinations and not always clearly related to industry standards. It was less related to the 'real world', although where it occurred, visits to work sites as part of the assessment process was a strength. So, the functional authenticity of assessment was less than under CBT.

Under CBT assessment is more related to 'real life' situations, both because assessment can occur in the workplace and because the competencies and learning outcomes are defined with industry standards in mind. Yet there is a cautionary note, for the increase in standardisation of assessment works against the opportunities for trainees to be able to demonstrate their capacity to function under a variety of circumstances. With different enterprises, the needs will be different. Assessment can sometimes omit important aspects of performance, for example, if the standards on which it is based are not sufficiently comprehensive, as in the following case.

> *CBT is generally about an individual's competencies and fails to recognise the need for people to work together. Even competencies related to 'teamwork' are broken into what can be described as 'imitatory elements', this fails to recognise the interrelationship and interdependencies between competencies. Therefore under CBT, competencies are generally assessed according to individual competencies. This fails to recognise that workers use a range of competencies in the workplace at any one time and that their strategic and collective competence is what is important to the workplace. CBT is important to workers as it is used to judge what they can do and what they should be paid. As distinct from what they can memorise, describe, write about or articulate, i.e. the focus is on their demonstrated competence in action.*

Another real change is the introduction of RPL, so there's more recognition of performance in the workplace supported by documentary evidence. So we see apprentices using accelerated progression relying on work done in the workplace or through other training providers. Greater authenticity and variety of assessment settings provide opportunities to demonstrate adaptability.

As a result of the implementation of CBT, the focus of assessment is more on demonstrated competence in action rather than memorisation or articulating what is to be done. Competency-based assessment is more closely linked to 'real life' situations of work. Employers are the winners because the training they are accessing for their workers is more focussed on specific workforce needs. While workplace assessment is common, simulations and role plays (e.g. in a training restaurant) provide an opportunity to practise in a safe environment, followed by observation and participation on the job.

As to the future, it is claimed that on-site delivery would improve assessment practices. Testing of specific tasks should be extended as part of a real job as it would occur in the workplace. For example in automotive repair, once a trainee has been tested on a master cylinder they should have to be tested again if working on a master cylinder is part of a bigger job. Also when a job is done the piece of equipment should be tested to make sure that it really works and that the motor vehicle could be driven away by an owner at the end of the day.

In engineering, assessment is needed that is related as closely as possible to a task in the workplace so trainees can appreciate that a task is done for a real purpose and at a standard that industry demands and expects. Assessment in the workplace is where we should be heading so that industry can take a greater degree of responsibility for its own training. Workplace assessment is needed so the trainee can see that their employer can sell the product made by the trainee, particularly in the construction area where there are life-sized products. Just because you learnt it in college doesn't mean you can do it at work.

Complexity

The results provide direct evidence of the need for complex intellectual abilities such as those involved in fault diagnosis, creative design and problem-solving. Examples from both industry areas illustrate the point:

> *Employers benefit greatly from a fully trained person as they can introduce new ideas into your business. It is quite short sighted to consider only those skills for which there is an immediate need—this won't help you grow the business. For example the food we prepare today is very different from that we prepared 10 to 15 years ago. The style of cuisine changes on a very regular cycle—so you need people who have the skills to do both the old and the new and draw from the old to create tomorrow's new.* – hospitality

> *My view is that we are not only training apprentices for ourselves, but for the future also. So it is important that they complete a full credential. While I know some of the modules they undertake have limited or no direct application to this workplace, having broader skills is of advantage to solving problems on the job.* – hospitality

> *So you can't say everybody who's a boilermaker or electrician does exactly the same thing all day every day, and you can go down the different companies and say they're identical. Well, they're not identical but you'll probably find that there's a lot of commonality amongst what they do.* – metals

The Results provide evidence that such abilities are being developed and assessed in select areas:

> *It depends on who is doing the training.* [Our] *employees have very good skills including problem-solving skills. They are generally able to understand and to solve problems—we only employ the best, and our training is top of the range.*

Yet the paucity of references in the data to the assessment of problem-solving and creativity suggests that most trainers and students are not aware of the importance of such abilities and that assessment is not geared to examine them. Clearly this is of concern for workplaces which are under more or less constant change and where new products, new practices and new technology are being introduced at an increasing rate.

Integration

Stevenson (1994) emphasises the importance of adaptability and expertise to integrate knowledge and skills from various sources. Thus assessment for expertise ought to test this ability. The Results sections of most importance in addressing this issue are AA6

and AA7 which asked about assessment prior to CBT; PA5 and PA6 for changes to assessment as CBT was implemented; OL8 for evidence of improvement in learning under CBT; and FA2 for how assessment practices ought to be changed in the future.

On the question of antecedents (AA6-7 *What were the strengths and weaknesses of assessment practices?*) the Results summarised in the 'Learning' section of table 5.4 are most relevant. These indicate that before CBT, the graded system of assessment was more holistic and that examinations and other forms of assessment that tested large chunks of work, encouraged a degree of integration and accumulation of what had been learned previously. This provided an encouragement for broad skilling and problem-solving. By contrast under CBT, assessment while more practical, made it difficult for students to research their own topics and did not provide enough integration of theory.

On the question of changes to assessment as CBT was implemented, the sections 'On-the-job assessment' from PA5 and 'Curriculum' from PA6 are most relevant. The point is made about the more integrated nature of assessment pre-CBT, and, as illustrated in the quote below from a food and beverage teacher in hospitality, the need to integrate from separate modules.

> *Now that's all in separate modules ... it's hard to break down waiting on tables—you have to assess the whole thing ... The problem is they need all those things together.*

Under CBT there is a need for a more holistic approach to produce competent students.

While question OL8 asked for evidence of improvement in learning under CBT, many responses indicated that learning had not improved, as summarised in the 'Negative' section of the Results. The main points were that CBT can be too broad, giving trainees little knowledge in a lot of areas, that training needs to be delivered holistically with the component pieces pulled together and that there is a loss of the 'broad education' that would allow trainees to think and get jobs in other places.

On the question of how assessment practices ought to be changed, Results from the 'Holistic and Accumulative Assessment' section of FA2 are relevant. In the future, assessment ought to also assess multiple learning outcomes, be more global especially in the areas of supervision and interpersonal skills and ensure that previously acquired knowledge is integrated with new work. For example the reintroduction of final exams or project-based assessment at the completion of a set number of modules would further recapitulate on the subject matter. Other solutions raised were to test later or over a period of time to monitor increase of performance, rather than marking as a once off.

Thus the partitioning and assessment of learning into small modules, as is now common under CBT, is unlikely to bring about integration of knowledge that is required for expertise. More holistic, global and integrating assessment which accumulates within and across modules is called for.

Conclusions

CBT brought pressures towards greater uniformity aligned with industry standards and a very substantial increase in testing, record keeping and auditing. Assessment became more workplace oriented but also more dominant and more focussed on once-off performance of disaggregated skills. Six indicators of expertise were used in appraising the evidence. Incentive for students to perform well is lowered under a non-graded system. Practice is enhanced by the added emphasis on performance. However, broadening and deepening of assessment tasks with a re-emphasis on understanding of theory and its contribution to performance is needed for the

development of expertise. Assessment in authentic settings such as simulated or actual work as happens more frequently under CBT is positive in terms of expertise. However the lack of emphasis on complex tasks such as problem-solving and creativity and on the integration of knowledge and skills from differing sources is cause for concern if a more flexible and responsive workforce is to be achieved. Thus, for assessing expertise, while there are encouraging signs in terms of authenticity and practice, there are also some serious questions about assessment practices as they are now commonly implemented to provide for the kinds of flexibility and adaptability of the Australian workforce that will make it more globally competitive. These findings are also consistent with those of another study of the Australian CBT system (Mulcahy & James 1998).

6 The role of the instructor

Lawrence Angus, Terri Seddon, John Gough and Ian Robertson

This chapter examines the impact of CBT on the role of instructors in institutes of technical and further education (TAFE) and in other training providers in Victoria and Queensland. The overall purpose of the chapter is to examine the effects of CBT on instructors as individuals who teach and on the occupation of teaching.

Although it deals mainly with data presentation and analysis, the chapter has a slightly different emphasis and style, as well as format, to that of chapters 4 and 5. In particular, in this chapter the focus of the analysis is, in an holistic sense, on ways in which teaching work has changed since the introduction of CBT and how such change has been accommodated within the experience of being an instructor. In this respect, it is our intention to examine the significance of what participants say about CBT and its influence on the work and experience of teaching in the vocational education and training sector. In this chapter, while we are concerned with the weight of participants' opinions about aspects of CBT, including the influence of CBT on curriculum and assessment, we are still more concerned with the reasons they give for holding such opinions. We attempt to draw on the reasoning of participants in order to understand the broad influence of CBT on the role of instructors.

The term 'teacher' is used throughout this chapter. It is the terminology of many of those who were interviewed in the course of this project and, more than 'instructor', better captures the complex array of practices which make up educational work in vocational contexts. This nomenclature is also used because it permits linkages to be made with the broader research on teachers and teaching. These linkages are helpful because they ground the current project in wider research and make its findings amenable to analysis using more sophisticated approaches to the analysis of teaching.

Understanding the instructor's role

Research on teachers and teaching has taken three major trajectories. Some of the earliest work was undertaken by Waller (1961) who sought to develop a sociology of teaching as an occupation.

This kind of approach was marginalised in the post-war period by a long tradition of education research which focussed on teachers as individuals engaged in processes of teaching and learning. The emphasis in this latter work was on teaching practice, relationships with students and on classroom activity. Very little attention was devoted to teachers' relationships with other teachers or with groups and agencies beyond the classroom. Considerable effort went into identifying teaching and learning styles, documenting the characteristics of good teachers and defining the traits that constitute teachers as professionals and teaching as a profession.

This teacher-focussed research tradition has been challenged since the 1960s by two further research approaches. The first began to build upon the early work by Waller. It looked beyond the classroom and teachers' relations with students in order to contextualise teachers and teaching more broadly. It adopted ethnographic and biographical methodologies to document the experience of teaching and, drawing on the sociology of work, it considered teaching as a distinctive kind of work.

The second challenge to the teacher-focussed research tradition drew on human capital theory to examine the role of teachers in the development of human capital. In the 1970s and 1980s this third type of theorising informed education policies which encouraged skill development in teachers through extended pre-service teacher education and professional development. Through the 1980s and 1990s, human capital theory was revised in the light of economic theories which assumed that individuals were rational actors, motivated by the pursuit of their own interests. This conceptualisation encouraged the view that individuals participated in education as a form of personal investment. Education and training could therefore be seen as a productive industry, producing human capital for the national economy. Teachers were seen as a factor in this production process. As an instructional technology in skills formation, they came to be seen as 'instructors'. As in other industries there was a quest for productivity increases. In education and training these efforts focussed on ways of maximising learning output through the learning production process and on ways of reducing costs of production. In the new rationalist discourse, 'quality' providers maximised learning productivity per dollar (Marginson 1997).

These research traditions can be characterised in relation to three disciplinary frames:

- a psychological/cultural approach which examines teachers as individuals, their practices of teaching and the meanings they make of their work
- an economic approach which examines teachers as instructional technologies in learning productivity
- a sociological approach which attends to the cultural and economic aspects of teaching but is integrated with an analysis of teachers as workers. This approach draws attention to the nature of teaching as work and its common features with other work and workers. It also focusses on teachers as an occupational group with their own values and views of what their work entails

It is this third approach which informs the analysis of the role of instructors in this chapter. This approach has been deliberately chosen in order to enable the researchers to comment not only on specific instances or examples of ways in which CBT has had a direct influence on the way teachers teach, but also on the effect of CBT as a policy on the way in which the work of teaching is conceptualised and enacted.

Teachers' work: A conceptual framework

The role of the instructor can be conceptualised in different disciplinary frames. The very notion of 'instructor' in the framing of the project in the current social context is indicative of an economic perspective on vocational education. However, the analysis of the 'instructor's role' from a sociological perspective, which is undertaken in this chapter, contextualises the 'instructor' somewhat differently. In the latter perspective the focus of attention is on:

- the role of the instructor in instructional processes. The primary focus is on *teaching practices*
- the role of the instructor in educational work. The primary focus is on the work of teaching, that is, the *teaching labour process*
- the role of the instructor in organisational/institutional sites of educational work. The primary focus is on *teachers' work* overall, encompassing the teaching practices and relationships, the teaching labour process, work organisation, employment relations and industrial relations

This chapter focusses upon the impact of CBT on the role of the instructor in terms of (a) teaching practices and (b) the teaching labour process. Given the approach we have taken to data collection in the project, we are less able to comment on matters such as

work organisation and industrial relations in particular sites of vocational education and training.

Connell's (1985, 1996) seminal research on teachers' work captures the core concerns of the sociological approach to research on teachers and teaching which incorporates the frames listed above. He states, 'teachers are workers, teaching is work, and the school is a workplace' (Connell 1985, p.69). This way of looking at teachers draws on industrial sociology to focus attention on the nature of the teaching labour process, the division of labour within learning contexts and patterns of workplace control and autonomy.

Two points should be noted about this perspective in relation to the current project. First, Connell's research was based upon a major funded study of secondary schools. It looked at school teachers not teachers in other learning contexts. Despite this particular orientation to school education, the roots of this tradition in the sociology of work give the conceptualisation of teachers' work a generic quality. The concepts used and the investigative themes have been endorsed through research in relation to many different kinds of work in a vast array of industries. This includes research in vocational education in relation to other professionals as well as TAFE teachers (Angus & Seddon 1997; Brown et al. 1996; Seddon et al. 1997). This breadth of application and research justifies the use of these key concepts and themes in the current analysis of teachers and teaching in vocational settings. However, there is little tradition of research directly on teachers of VET at all, and certainly very little that has considered VET teaching within concepts and perspectives derived from the sociology of work. In Australia, the literature we identified that comes closest to a serious sociological analysis of teachers' work in VET is recent analyses of training that are informed by the notion of the training organisation and related concepts derived from organisation theory (Sefton et al. 1995). This latter work is in many respects consistent with the approach taken by Connell and other analysts of professional work. Largely for these reasons, we are confident that the perspective is useful for generating insights in relation to Project #6 in particular.

The second point to be noted about this perspective is that the focus of the current study of the impact of CBT on the instructor's role encourages attention to the central practices of teaching rather than to broader issues of work in vocational education contexts. These broader issues include:

- employment relations—the negotiation of selection and appointments, training and reward
- work organisation—the social and technical organisation of workplaces
- industrial relations—the collective bargaining and negotiation of pay and conditions

The primary focus in this chapter is therefore on the teaching practices and the work of teaching in vocational learning contexts, with only passing reference to these broader dimensions of educational work.

Understanding the labour process of teaching

Connell describes the teaching labour process as:

> *... a labour process without an object. At best, it has an object so intangible—the minds of kids, or their capacity to learn—that it cannot be specified in any but vague and metaphorical ways. A great deal of work is done in schools, day in and day out, but this work does not produce any* things. *Nor does it, like other white-collar work, produce visible and quantifiable* effects—*so many pensions paid, so many dollars turned over, so many patients cured (emphasis included).*
>
> (Connell 1985, p.70)

When writing in 1985, Connell could hardly have been aware that the introduction of CBT would be linked conceptually with the proposition that learning *can* be quantified. But even the CBT view of the quantification of learning is consistent with the view that the product of learning is a person whose knowledge and understanding has changed; not any artefact. Connell's point is that, like other workers, both blue and white-collar, teachers are involved in a particular kind of work. It has purposes and objectives. They are realised through particular social and technological organisation in which teachers are shaped in particular ways to do particular things. This work is negotiated, as in other workplaces, between employees and employers in the context of broader social and economic pressures and constraints. But teaching differs from other work because its object is *learning*.

The core business of teaching is not to produce fixed products—so many facts absorbed, so many competencies achieved. Facts and competencies are important in teaching and learning but their transmission and development account for only a small part of the work of teaching. Rather, it is to develop in students an expansive capacity to learn and to continue learning through life. In a sense, such goals of teaching might be regarded as 'process outcomes' but even this terminology fails to capture the variability of teaching tasks and effects, and the difference that good teachers make to the learning outcomes of students.

The organisation of educational work has developed in order to realise this expansive capacity of learning to learn. Within the tradition of research on the labour process of teaching and learning, then, a number of aspects of teaching that are believed to contribute to productive learning and the capacity to learn have been identified. In some respects, although derived from empirical studies, these findings can be couched as normative statements about teaching which identify an active role for the teacher in the learning process. Five key features, in particular, seem to best characterise such work as 'teaching':

- It entails a joint labour process between teacher and student—unlike other manufacturing processes, educational work does not produce fixed products from fixed raw materials. Students have their own agendas; they have preferences and make choices about what they will learn. Teachers do not simply transmit or 'deliver' knowledge, skills and attitudes that are absorbed by the student. There is negotiation, conflict and encouragement of learning. Without this intangible interpersonal labour, learning productivity is compromised.
- Learning output is generated through processes of co-production by teacher and student—it is not the result of inputs into a production process but a consequence of teacher and student engagement in the work of learning knowledge, skills and attitudes, and learning to learn.
- The output of the teaching labour process is increased capacity for social practice—it includes identifiable increases in knowledge, skills and attitudes amongst students but it also, and more importantly, includes extended capacities for learning to learn, for making judgements and realising this learning in better understandings and action. It creates capacities for social practice that do not just depend upon increases in knowledge, skills and attitudes; rather they depend upon the integration of knowledge, skills and attitudes into broader frameworks of understanding and action.
- This output of the teaching labour process contributes to individual development and also collective capacities—learning serves individuals because it enhances their development as capable social and occupational actors. But the increase in individual capacities for social practice also benefits the wider community because together these individual capacities extend the capacities of workplaces, communities and the nation to act responsively in changing times.

- Capacities for social practice which rest upon the expansive ability to learn and continue learning are the property of the individual and of the collective—while individuals benefit from learning and become valued added as human capital, their contribution to collective benefits in workplaces, communities and the nation cannot be ignored as simple externalities to human capital formation.

Historically, these key features of the teaching labour process have been organised in distinct ways. They can be seen as:

- work practices relating to curriculum, pedagogy, assessment, administration and pastoral care
- relationships, primarily between student and teacher but also between education and government, and education and wider community groups. These include groups of parents, regional communities, and industry
- occupational cultures differentiated by sector and specific learning contexts but oriented, in an overarching way, towards particular normative commitments to the production of certain kinds of learning outcomes and the encouragement of learning to learn

The overarching normative orientation within the teaching labour process is grounded in the character of education as a social institution with its own internal norms, rules and cultures. Goodin (1996, p.21) argues that education is one of the major social institutions. From this perspective, the contribution of education lies in the teaching of the young and inexperienced so that they become adult and experienced social actors. Education as a social institution serves to enhance and develop the cultural heritage of a society, its ways of thinking, doing, being and living for subsequent generations. While we regard Goodin's view as overly functionalist, he nonetheless correctly identifies the importance of education for social production and social continuity, and for developing the capacities of students to exercise social agency. Education also, and importantly, transmits the capacity of learning to learn to subsequent generations, ensuring that society has a collective capacity for learning, for dealing with change and for developing new capacities for action.

The institutional rules that shape organisation and practice within education are different from the institutional rules that shape and organise practice in other social institutions that make other social contributions. For example, education sits alongside but cannot be subsumed within the institution of economics, which is oriented to the regulation of production, distribution and consumption of goods and services within any society (Goodin 1996, p.21). The social contribution and responsibilities of education and the economy differ. Participants in this study almost universally agreed with this point even though many of them considered that economic imperatives had become more influential within education. Where education and economics overlap in their effects, such as in contemporary education and training policy, there is likely to be ongoing contestation around the distinctive institutional capacities and their particular social contributions. This is because the erosion of institutional rules relating to any social institution undermines the social contribution of that institution and, hence, the overall functioning of society.

Each social institution therefore plays a necessary, not exclusively conservative, role in making social life possible. As Goodin (1996, p.22) notes, institutions establish the stability and value of organisations and procedures, 'Indeed, that very stability and predictability is, to a very large extent, precisely why we value institutional patterns and what is valuable about them'. He continues: the economic benefit of institutions lies in 'reducing costs associated with uncertainty across time' (p.22). Offe puts it in slightly different terms:

Institutions ... inculcate duties and generate outcomes. In order to generate outcomes, they must rely on cognitive and moral resources which ... are not created by administrative fiat.
(Offe 1996, p.202)

Offe's point is that institutions both create new, and depend upon existing, meanings, norms and values in the production of outcomes. While outcomes may be subject to administrative redefinition and changes in technologies of accountability, such organisational strategies cannot directly change institutionally grounded cultures that are lived in day-to-day practices of organisation and embodied by workers who are, simultaneously, functionaries within organisations and institutional actors. The shared meanings of such organisational/institutional actors are confronted by organisational changes but not necessarily changed by them. This is the case, for instance, with the introduction of CBT as a policy and as a work practice. What eventuates from such confrontations between organisational changes and institutional cultures is contingent and unpredictable. This is because it depends upon patterns of advocacy, resistance and revision and how continuity and change is advanced in practical ways at different sites. Such patterns are influenced by institutional, organisational and personal histories. For example, we could expect that responses of teachers in the metals sector to the introduction of CBT would be different from the response of teachers in the hospitality sector. The difference may be partly explained by contextual factors such as the relatively recent flourishing of hospitality as a significant area of education and training, and the different occupational cultures in the metals and hospitality industries.

Offe highlights the practical problem of organisational/institutional change:

'There is no administrative production of meaning'. *Consequently, whoever wishes to advocate, design, construct, change or criticise institutions will have to bear in mind this dualism and the inherent limits of potential control over meaning.* (Offe 1996, p.202)

In the context of teaching, the confrontation between administrative changes and organisational/institutional cultures are frequently evident as an intensification of teachers' work. As Connell (1985) notes, because teachers' work is complex and does not produce tangible and measurable outcomes, the teachers' tasks and roles have not generally been tightly defined. While, historically, this has given teachers some autonomy, particularly within their own classrooms, it has made the definition of teachers' work easily subject to change. Employers and governments have a long record of redefining the teaching labour process by shifting its scope, character and demands. As a result, teachers' work can be subject to almost limitless intensification and flexibility. This tendency is enhanced by teachers' core, institutionally-grounded sense of duty to students, colleagues and society which they frequently live out, implicitly if not explicitly, in confrontation with administrative re-definitions of their role.

The changing role of the instructor within CBT

A striking feature of the data is that individual respondents refer to themselves, almost without exception, as 'teachers' not 'instructors'. This nomenclature seems important and appropriate in the light of their descriptions of their work. In response to questions about what they do, teachers, from either sector or from TAFE or private settings, talk about teaching, working with students and with programs. But they also talk about an array of other activities besides the face-to-face work of teaching. They describe their involvement in curriculum design and accreditation, student assessment, mentoring of

staff, management and liaison with industry. Being a teacher is much more complex than just being an element in a system of instructional technology.

Contextualising the instructor's role

The features of educational work outlined in the above section have been subject to redefinition in recent government policies, informed by economic rationalist views of individuals and social institutions. While governments continue to espouse commitments to the 'clever country' or to other forms of national development through education, there is considerable ambiguity in emphasis. On the one hand, the rhetoric of lifelong learning, dealing with change and innovation calls for the development of expansive capacities for learning to learn. On the other hand, recent vocational education reform has been oriented to increasing the efficiency and effectiveness of learning productivity in vocational teaching. In practice, the CBT decade was characterised by a stronger concern with the latter issues of learning productivity than with the former issues of expansive lifelong learning.

The implementation of CBT has had a significant influence on the over-riding aim of enhancing national skill formation to make Australia more internationally competitive. Its benefits lie in the capacity of the technology to capture some aspects of teaching work. In particular, CBT is held to enable the measurement of particular types of outcomes of learning. Competencies capture the value-adding character of education in terms of understanding and action, but do not reduce education to the simple absorption of knowledge, skills and attitudes. Competencies properly challenge the notion that learning output is simply a matter of knowledge, skills and attitudes absorbed by students. Instead they emphasise the importance of not only knowing but also doing, and stress that the critical outcome is the capacity to translate knowledge, skills and attitudes into applications and action in the workplace. Furthermore, the specification of learning outcomes in terms of competencies makes learning tangible and measurable.

The limits of CBT lie in its application as an administrative technology which makes learning outcomes tangible and measurable in largely behavioural terms and which then deploys the tangible measures within an economic rationalist institutional re-engineering agenda. The effect has been to reduce the complexity of the outcomes of the teaching labour process to simple indicators that reify particular aspects of competence. CBT leads to assessment of what students have learned to do in particular settings but, according to many of our respondents, not of their capacity to continue learning and to adapt behaviour to changing conditions. CBT has driven providers, working within constrained and uncertain funding contexts, to redesign the social and technological organisation of educational work in order to not only meet the specified goals but to achieve more learning product for each dollar. Because CBT policy sees instructors in economic terms as part of the technology of teaching, there have been moves to extend communications technology applications in education and to drive cultural change in the teaching occupation through mechanisms of accountability, central control and enforced efficiency gains.

The key limitation of this policy direction is that it approaches learning productivity in organisational rather than institutional terms. Learning productivity is seen as a corporate problem of how to organise best resources and labour within an enterprise in order to produce preferred outcomes. It neglects socially useful institutional capacities and treats institutionally-grounded practices, relationships and cultures associated with the teaching labour process as an organisational problem, a 'structural rigidity' to be removed or flexibilised in the corporate interest.

As the CBT decade passes, the inherent ambiguities in training reform, the emerging contradictions in policy directives and the confrontation between corporate re-engineering and the grounded and lived organisational/institutional cultures have combined to destabilise the administrative technology of CBT. CBT is pulled in different directions. As chapter 2 indicates, the intent behind CBT reforms was pursuit of uniform tangible and measurable outcomes which some commentators see as a way of increasing control over and management of vocational education rather than increasing quality of educational outcomes. But, since the start of the CBT decade, there have been changes in the institutional context in which CBT is being implemented. These include the move from TAFE to VET; the increased emphasis on managing VET; and the growing significance of decentring reforms that pressed VET towards an enterprise and individual focus. These changes have created contradictions between standardising and diversifying imperatives in vocational education. The 'mere implementer' role of instructors in centralised CBT provision is challenged by diversification of provision, deregulatory and enterprise-based developments and the increasing vocal plurality of demands in vocational education.

Teaching practices pre-CBT and post-CBT

Prior to commencing our detailed discussion of changes to teaching practices during the CBT era of 1988 – 1998, it is necessary to provide a brief characterisation of the metals and hospitality industries circa 1989 and a brief account of the contemporary development of TAFE. While noting that some such explanation has been provided in earlier chapters, some description is also worth providing at this point as it is important to understand the work of teachers in the context of the development of metals and hospitality training prior to 1989, and to understand why each of these areas of training may have responded in somewhat different ways to the introduction of CBT.

It is worth noting, for instance, that the metals industry was highly organised before 1989 within an established industrial relations framework. The majority of training that occurred in the metals sector was apprenticeship based, and the centralised industrial relations framework of the metals industry controlled their pay rates and the number of apprentices employed overall in the industry. During the early 1980s the powerful metals unions were party to tripartite discussions (among industry, unions and government) which were aimed at devising ways of increasing the competitiveness of Australian industry and improving the lot of union members through such mechanisms as award restructuring and the structural efficiency principle. Therefore, prior to the introduction of CBT, training within the metals industry might have been characterised as well established within an industrial relations framework, with a tradition of apprenticeship training. The industry itself was instrumental in many of the decisions that were taken during the restructuring of what became known as vocational education and training. Furthermore, training practices had been well established in the metals industry prior to 1989 when a national project had commenced to develop 'national modules' that could be used to standardise training in the industry.

This situation might be contrasted with that of the hospitality industry, which could be described as having been in a state of relative infancy, at least in terms of numbers, in the early 1980s. Although it would be incorrect to say that training did not exist in the hospitality sector prior to the 1980s, it would be fair to say that, with the exception of apprentice cookery, hospitality training often occurred in specialist institutions, like William Angliss College in Victoria, which had long developed curricula and offered apprenticeships in bakery, pastry-cooking and butchery as well as cookery. However, there was little tradition of apprenticeship training in the system as a whole. Therefore,

as the hospitality industry grew rapidly with the tourist boom of the 1980s, and there were growing expectations of levels of customer service that would meet world standards, the hospitality industry was suddenly ideally placed to take advantage of increased funding in the vocational education and training sector.

It is also important to describe briefly the nature of vocational education and training in the early 1980s prior to the introduction of CBT. At that time TAFE provided the vast majority of government-funded vocational education and training. In subsequent years the sector expanded significantly in terms of student numbers and funding for program delivery and capital equipment. In Victoria in particular, much of the then-burgeoning TAFE sector grew out of technical divisions of education departments and, to a large extent, retained much of the culture associated with education departments. Moreover, as the training provision offered by TAFE expanded rapidly, there was increased employment of 'vocational practitioners' to deliver programs. In general, there was a strong expectation (and often a requirement) that 'vocational practitioners' would bring to TAFE significant relevant vocational experience as practitioners of at least five years standing. They were expected to have a deep knowledge of what was required in workplaces and how the work was done. The industry practice of such individuals was considered a valuable resource for teaching, and they were provided with teacher training, somewhat similar to that provided for secondary teachers, to equip them with pedagogical knowledge.

Having clarified our conceptual approach to the analysis of teachers and teaching, and having discussed both the contextualisation of vocational teachers in general and of the metals and hospitality industries within the contradictory developments of the CBT decade, we are now in a position to proceed with the detailed discussion of the data on the role of teachers.

The analysis of changes to the role of teachers proceeded according to examinations of three types of data:

- a detailed analysis of the TAFE teacher histories
- analysis of focus group data
- stakeholders' perceptions of teachers' roles

Teaching practices pre-CBT

Teachers generally described their teaching practices prior to the introduction of CBT with reference to curriculum, the organisation of students and assessment.

The results of focus groups in Victoria and Queensland suggest that curriculum development in metals had largely been centrally organised since the early 1980s but this had been less the case for hospitality. In response to the question, 'To what degree did you enjoy freedom in what was taught and how it was taught [prior to the implementation of CBT]?', teachers indicated that they had been mostly faithful to the curriculum that was set out but that, to a greater or lesser extent, they had experienced autonomy in the way they delivered the curriculum. While this general state of affairs was reported across all focus groups, there were some differences that emerged between the two States and the two industries. Indeed, most of the variations are consistent with the characterisation of the metals and hospitality industries provided above.

Firstly, Queensland teachers in both metals and hospitality spoke of the influence of 'senior teachers' in determining how the curriculum was interpreted and delivered in particular TAFE colleges. This was not the case in Victoria. However, it should also be noted that in both States, in both metals and hospitality, teachers also recalled and emphasised that a collegial approach was used in order to determine how

curriculum would be interpreted and taught. Teachers in both States and both industries typically used terms such as 'group knowledge', 'course team' and 'discussions with colleagues'. Teachers also identified factors such as local needs and the availability of resources as important influences on the way they interpreted and delivered the curriculum.

Secondly, metals teachers in both States talked about curriculum development as having been a centralised process whereas teachers in hospitality in both States had not experienced centrally mandated curriculum prior to the introduction of CBT.

Thirdly, Queensland hospitality teachers recalled the use of audits as a means of ensuring that what was taught and what was assessed in different colleges was consistent with what was stated in the curriculum. However, audits had not been a feature of hospitality teaching in Victoria, or of metals teaching in either State.

Finally, a focus group comprising Queensland metropolitan TAFE teachers emphasised that it had been important in the past to ensure that the curriculum was consistent with government regulations and licensing arrangements in the metals industry. No other group of teachers referred to this point.

The detailed teacher interviews provided a range of further insights into the nature of teachers' work pre-CBT. For example, in Victoria, both a curriculum officer and an ITAB representative from the hospitality industry asserted that the hospitality industry had 'always' been engaged in some form of competency training. This was said to have been the case in Queensland as well. In metals, a curriculum representative echoed these remarks with reference to his own industry. Similar comments were made by participants in focus groups in regional and metropolitan Victoria in relation to both hospitality and metals. Informants from both industries suggested that the content of training had not changed much over the years. For example, an informant who worked as an ITAB representative in metals said:

> *There have been numerous projects in metals over the last ten years or so. There has been very little change in the essential elements of curriculum and revised versions have largely been based on what already existed.*

An ITAB representative in hospitality provided similar advice about that industry, and such advice was reinforced in the various focus groups. One informant, using an exquisite metaphor, characterised curriculum development as 'periodic makeovers'. At least in the case of metals, it appears that the minimal substantive change to the curriculum that the 'makeover' metaphor implies was not only accepted by ITABs but encouraged by them. This conservative orientation was apparent especially when significant industrial relations repercussions might have resulted from major changes to training programs, the outcomes of which were linked to pay rates and career advancement.

For other non-teacher informants, including industry and enterprise representatives, the role of teachers prior to the introduction of CBT policy was generally seen in traditional terms. These respondents tended to assume that control over the curriculum rested with individual colleges and individual staff members. Program delivery was typically recalled as a teacher-directed process involving, essentially, 'chalk and talk'. A curriculum officer from Victoria, for example, claimed that: 'The State delivery system was what we call chalk and talk, the teacher-centred environment'.

The non-teachers understood that assessment was conducted by means of written examination, and that students were awarded grades according to the level of their performance. A Queensland curriculum officer, for example, expressed the view that:

Each college did their own assessment of students bearing in mind that at that stage the cookery syllabus was an eight page document including the front and back covers. Compared with what came after CBT assessment was very much an individual college thing.

According to these informants, industry tended to be fairly passive about accepting what TAFE was prepared to offer. They were in agreement that they knew very little about CBT before its introduction as a key plank in VET policy. One enterprise representative put the general view most concisely when asked about his own role in the provision of training prior to CBT:

I was the employer of apprentices who went to TAFE for some training. Other than that there was no involvement.

In speaking of pre-CBT days, many teachers emphasised what they referred to as the 'quality' of their relationships with students. For instance, a Queensland teacher recalled:

In the early years apprentices came on day release one day or one night a week. Then, when block release started, delivery strategies changed to get through more work in the set time. Exams were also centrally set, so teachers used to go through past papers to know what to teach. Questions did not change dramatically over the years so it was possible to use the past exam papers to work out what to do.

In those pre-CBT days students attended college for the whole of their apprenticeship training and assessment was based at the college. While there were expectations that employers would contribute to training, in reality, they expected that the college would do the teaching. It was very much a teacher-centred activity, with little action learning or self-pacing. There were some opportunities for group discussion, but mostly it was traditional chalk and talk.

In the olden days, pre-CBT, innovation had a different meaning:

The introduction of overhead projectors was a big innovation because, now, not all the diagrams had to be done in front of the class but could be prepared in advance. This saved class time.

In Victoria, the emphasis appears to have been less centralised than in Queensland even before the introduction of CBT. Another metals teacher remembers:

In 1985, I was working in an automotive training section … Our basic work was around auto LPG training and any other training that was required for the automotive industry on a regular basis and we had a commitment that we had to fulfil which was to develop our salaries, which we did. The program at that stage was called 'LPG Tuning and Maintenance' and it was a program that I had written in the middle 70s after working with a State instrumentality. It was very much a pre-cursor to competency-based training because we believed that there was only one way to do the job and that would be to prove that you were competent in that area, and we didn't follow necessarily the rules that currently existed in terms of curriculum documentation.

We believed that if someone was going to be capable of carrying out the necessary testing and repairs on a modern vehicle … they had to prove to me that they could use a multimeter and, with all of its facets, be able to determine that this was a voltage that they were going to check not a current; and there would be a resistance not a voltage … [This meant that when] *we delivered training it was very much student-centred. We would do probably an hour or an hour and a half max. on the theory and the rest of the day* [on practice]. *If that day was one third of the program, it was done as a multi-activity process where some people may have been doing theory, some people may have been doing what we considered to be practice. In that timeframe we would assess each individual observationally and then with maybe a written test, especially if it was a theoretical area. And obviously a practical challenge, for example, this is an ignition coil and I want you to test it and tell me whether it is good or bad. And it was on their own. They couldn't do it in pairs. They developed the process in pairs but when they had to be assessed it was on their own and we could select particular jobs that would be the assessment for them. We chose the*

assessment to prove the sorts of things that we had been training towards, the use of equipment to be able to diagnose a process and then maybe some transfer into fault finding, using a logical process to determine what the fault was … CBT has gone much further, very much student-centred and the teacher has become a resource.

In hospitality a similar emphasis on observable performance was evident. A Victorian teacher commented that she had:

… taught in areas where there are tangible outcomes, areas where something can be demonstrated and you can see a result. For example, if you had to assess whether someone could set a table for four, you would set the standard of what a table for four is and say, yes, you have achieved the competency or no you haven't achieved the competency.

In Queensland, hospitality teachers appeared to have more freedom than teachers in metals. One teacher noted:

Teachers were given subject topics and were allowed to develop their own lessons. Syllabuses were not very structured and teachers could follow their biases. For example, one teacher spent about 80 percent of a 'commodities' subject just on eggs, getting down to their molecular structure and so on. But a subject like this needs a broader brush approach and that is probably what the more structured approach of the new CBT brought.

The content of curricula was strongly emphasised by these teachers. Syllabuses 'had purposes, objectives and desired outcomes' (HT904). One teacher said she found this orientation difficult when she commenced her career:

I found when you first started, that we pored over the outcomes, and then you tried to put it into some sense for you. Because when you are new you really don't understand the educational aspect and it takes a while, especially if you are an industry person to learn the language, yes you did have a syllabus for each subject, if we didn't know anything about a particular topic then you would organise guest speakers to come.

Others talked about the syllabus as a list of topics from which they had relative freedom to develop lessons. One Queensland metals teacher noted 'For specific content, it was common practice for teachers to rely on the external notes from the technical correspondence school'. Another Queensland hospitality teacher said, 'There was a template to follow to fit in with TAFE guidelines for butting subject materials together'.

Some teachers saw the syllabus as a guide that they tailored to the local environment.

I would often change the syllabus. I am a great believer that the syllabus is just a guide and if you've got some good students you give them a bit extra—if you've got some students that aren't so good, then you might hold back a bit. I see the syllabus as a guide. It rarely changes substantively, although they have periodic makeovers of them. The same pieces of paper always come up with different dates on them. I tried to make the syllabus workable, to include local aspects and so on.

Usually you didn't go outside the syllabus except if there was a local environment that you were aware of. You would try and make sure that was involved, or catered for, so that the local differences, you know, were incorporated within the curriculum. But you still stayed within your assessment criteria.

As another teacher commented, this freedom to design lessons created idiosyncrasies in the provision of training, which was compounded because there were no overall course assessors. The problem was not rectified by the introduction of CBT:

Without assessors you can deviate. What was required was to leave the damn thing [syllabus] *alone and bring in more 'policing' of what was taught. But the response to go to CBT wasn't the sort of policing I was thinking of.*

As these comments suggest, there was a close relationship between teaching and curriculum and assessment. The curriculum was specified in terms of content and the examination was used to guide teaching practice. Assessment was also the responsibility of the teacher. It required the teacher to make judgements against 'standard gradings' of pass, credit or honours.

The assessment used a graded system of honours, credit, pass and fail. And the apprenticeship system had a bonus in wages (over 80% gave 5% increase in wages for following year). In terms of failures, no supplementary process (as we have now) were available. If I failed then I had to repeat the subject in the next year and so this increased the period of indenture. The grades accumulated towards the final certificate in the trade.

Judgements about performance were made in particular contexts by teachers themselves. When asked how such judgements were made, a typical response was as follows:

Through observations—mainly through live work. There were very few times when a student would just stand there and show you how to do a task. You would watch them in a work situation—almost like workplace assessors these days. Take opening a bottle of wine. We would look at the student's skills, first of all opening it, the time—how long it took him to open it, and finally how competent he was at doing it. We had a graded assessment, 1-7. And on the final report the student was given some kind of a grade such as pass, credit or honours. Sometimes we would have to make value judgements about whether to bump people up a few points if they were just one or two marks short of a credit or honour. There were lots of value judgments.

Teacher judgements were critical to assessment but, as teachers noted, so were the judgements of other agencies.

Let me take this from an industry point of view. Industry recognised the strength of a particular establishment, possibly, rightly or wrongly, from the personalities of the teachers involved; possibly on the standards set by the teachers; possibly on the discipline or responsibilities they throw back on the students. But certainly once a student got an honours from a particular college, the student was considered worth having.

As a number of these quotes indicate, teachers had strong relationships with industry prior to CBT and such relationships were valued by them because they helped them to maintain the currency of their vocational experience.

I made myself go back to the industry because of the programs and then a couple of years ago I was invited to go over to Malaysia and open up a few Malaysian hotels, huge job for myself and colleagues and that was very, very hands-on, if you didn't know enough beforehand you left knowing plenty. In education particularly concerning keeping up with the changing trends, we maintain links with industry by going out and visiting properties, keeping in contact with people; we have to know the industry. So yes I would say I keep up with industry as much as possible.

Relations with industry varied. Links with large employers were easier to maintain than with small business and they were much stronger when there was only one major employer in an area. Sometimes they were formalised in curriculum committees but very often they were just based on teachers' networking with their relevant industries.

At the time I didn't have much contact with curriculum writing committees or industry bodies, so the only input I got from industry people was through talking to people, networking and that sort of thing.

These industry links permitted a range of industry support for training:

Here ... where I did my own apprenticeship, strong relationships with industry have formed and that makes my job a lot easier. Consequences of strong relationships are accessibility to resources that the college may not own, such as the use of equipment on this site through borrowing or, eventually, donations. And also industry is not afraid to come in and say I don't think you are

doing this or that well or ask how can we improve this aspect of training. Through these relationships industry came to see that TAFE curriculum is not entirely designed at Rockhampton but then, if we wanted, we could enlist industry's help in raising support for change with the central curriculum branch in head office.

These linkages extended to industry involvement in curriculum design.

Industry had a lot of input into training even back then. Any of the curricula that were developed, were developed in association with industry by arranging representation. The only thing is, TAFE owned the curriculum because they were the responsible agency and none of the curricula that I have been associated with, or courses, was ever released without an industry involvement and approval.

Pre-CBT Queensland teachers talked of the considerable freedom they experienced.

I never felt bound to one delivery strategy and I guess I saw the syllabus as a minimum. It depended on the group of students as to how far you could go beyond this set minimum. Your own passions could be indulged, as there was sufficient freedom to determine what was taught and how it was taught beyond the minimum requirements. You can still see teachers adding a personal touch at the moment. There are teachers who are innovative and look at what they deliver and how they deliver it. It's the thing that can give you a bit of a buzz.

Oh, total freedom as far as I was concerned. You had a syllabus document to work with and you had, you know, a recommended depth of treatment, profile, that your curriculum set out, but how you delivered it was entirely up to you. We've had progressive assessment, we've had situations where you had to do laboratory assignments or prac. work as part of the examination process, so that freedom's always been there as far as I'm concerned.

Clearly one of the consequences of greater freedom pre-CBT was variation in training delivery. This diversity appeared as teachers attempted to bring localised content into their teaching and to tailor their classroom practice to students' particular interests and learning needs. Such tailoring provided opportunities for teachers to properly contextualise their curriculum, teaching and assessment to meet clients' needs and requirements. On the other hand, these variations could be so extreme as to become improper biases in teaching as in the case of the teacher who taught about eggs. The regulation of teaching and teachers:

relied a great deal on communication between the staff members who were delivering and assessing the individuals. Without the communication we would have fallen over and I think the reason why communication was good was because there was only four of us, and four of us ran the department, delivered the product, assessed the product, did everything.

Ideally, such communication established a culture of good practice that was embodied and lived in day-to-day collegial relationships. In these relationships responsibilities to industry were recognised and obligations to students, industry and other teachers were accepted as part of a moral code that served as a self-regulatory mechanism amongst trainers.

The sense that emerges from these data is that pre-CBT teachers' work was, in many cases, somewhat holistic. It certainly encompassed a wide range of activities which were not always tightly specified and defined. Indeed, it could be said that, for good teachers in the pre-CBT milieu, these activities were guided and enacted because of teachers' sense of the work to be done and the responsibilities and obligations they felt to their occupation of vocational education, to students, industry, regional communities and their colleagues. Experienced teachers among our interviewees and focus group participants confirmed that such was the teaching 'ideal' pre-CBT. CBT, as we discuss below, brought a more tightly structured approach. It pressed towards uniformity and standardisation of provision while, at the same time, it amounted to a mechanism for controlling the most unpredictable factor in teaching delivery, the

teacher. While curtailing teacher autonomy, however, CBT nonetheless permitted the tailoring of teaching to industry, enterprise, regional and individual requirements.

The implementation of CBT

Teachers confirm that when CBT was introduced they knew relatively little about it. Individual teachers recognised that it was 'based on tangible outcomes'; 'very much student-centred' and that, within a CBT approach, the 'teacher [was regarded] as a resource'. Some also knew that versions of CBT had been implemented overseas: 'I think even Germany was involved at one stage'.

One teacher saw it as a fad:

> *There was a feeling probably from about 1989 to 1994, that CBT, which had been tried in the United States and the UK, was a method worth trying here. People travelling abroad for educational purposes were returning with new gospels. Transactional analysis was one such gospel, Total Quality Management was another (and there were many more). These people came back enthused about what they found. They were prophets bringing the 'good oil' home. There are certainly merits in CBT, but it is not the medicine for all ills.*

Once CBT had been introduced, many teachers say they recognised that some aspects of their prior practice had been consistent with CBT.

> *I didn't know a lot about CBT, particularly from the point of view of practical training. Later I realised that I had been doing many aspects of CBT especially in a practical way.*

There was also recognition that the introduction of CBT modified the way teachers did their work:

> [CBT] *forced us to become more formalised in the production of objectives, learning outcomes sheets.*
>
> *CBT is breaking learning and assessing down into smaller chunks.*

To paraphrase slightly a comment made during a focus group of regional TAFE metals teachers in Victoria, a major point made about perceptions of CBT is that it has come to mean a style of delivering training rather than a particular form of pedagogy, curriculum or assessment:

> *We've been doing outcomes-based training for years. It's about the skills and knowledge required to do the job to the standard required in a safe manner. The outcomes have remained stagnant, the method of achieving these outcomes has changed. CBT has come to mean self-paced, off-campus, workplace based. A way of doing things for less.*

Teachers in another focus group (Victorian TAFE metropolitan metals teachers) reflected on changes to the nature of their work since the implementation of CBT. One said:

> *Before, I had a job which was holistic. Now it's broken into bits. But we're still doing the same things; it's just more controlled.*

In this focus group, a change in the relationship between teachers and students was also described:

> *In the past, a group went through and we helped individuals, now it's individualised but individual students don't get the same help.*

For non-teacher interviewees, there was a strong sense that, with the introduction of CBT, curriculum and assessment were now shared responsibilities. Industry was typically perceived to have been accorded a 'serious' level of input into both curriculum and trainee assessment. Industry and enterprise representatives tended to define themselves as the 'client' towards whom control over the system in general had

gravitated as a result of recent policy. These informants were agreed that there was a paramount need for flexibility on the part of teachers in the new training environment.

Although TAFE teachers could identify specific continuities and changes in their work as CBT was introduced, their more discursive commentaries suggest that the implementation of CBT had quite subtle effects on the range of teaching practices they could use. CBT, they maintain, had an influence on the interrelationships between curriculum, teaching and assessment, and on teachers' relationships with students. A Victorian metals teacher indicated that 'mixed mode' teaching had become more firmly established and that, as assessment has become increasingly emphasised, teaching time has been reduced to allow time for students' self-managed learning.

Automotive has a history; what I consider to be pro-active in delivery methods. When I was originally starting we were very student-centred and tried to develop materials in the hey-day of student-centred training (performance objective) style training. We tried to develop paper-based materials and some videos and some slide tapes to deliver the program in what we thought as a fun and interesting way and that progressed on. So when I went back in 1994 a lot of that was already in place and it had been sharpened up a lot.

When the student comes in; lets say it's a Monday and they are in for a block … We might make the decision to go to weekly block release rather than daily block release; because of some of the tasks. For example one of the tasks is to remove a head of an engine, check and start it up. Another one is to dismantle the engine and reassemble. Now that is very hard if it is the first time you have ever done it; and it's unfair to only give them eight hours to do it in. What we have are student learning guides, so the student will come in and he will be organised to level 1, 2 or 3. The student will know from the previous block where they have to go; because he would still have work that he has to complete from that week. He has a learning guide, print-based material which provides a guide on what he has to do and how he has to go about it. So he then has to go to the ORC, do some research, and then we identify what areas he has to look at. It may be computer-based, video, or paper-based research. As long as the research comes back to the instructor so the instructor can see that he has completed the set tasks, the instructor reviews the work he has done, questions him in terms of his understanding of what he has put into his response. So the instructor is doing an evaluation; firstly on an observational level and secondly a critical evaluation in terms of the things the student must know before he goes and does 'that'. So once that is done the student will then be allocated a practical area somewhere in the workshop; it may be on a motor vehicle, it may be on a model, or a live model; it is very much up to the student to apply himself/herself to the knowledge factor and then move into the skill area. And hopefully out of that there will be some attitudinal changes with that.

In Queensland too, a teacher indicated the complex ripple effects of CBT on teaching practices, noting that traditional and flexible teaching now existed side-by-side.

We have traditional delivery in TAFE and at other … We are into distance delivery. Employers delivery with educational support from us (i.e. validation and moderation), self-paced delivery on and off site, one-to-one face-to-face delivery in workplaces by standing by students as they are producing a product for their employer, monitoring and mentoring in the workplace. We also engage in mixed mode delivery involving any number of those methods or principles. Also we see technological aids in use: CDs, videoconferencing, internet, teleconferencing, and a whole range of technological advances.

One way of going with CBT is that we have developed learning resources which have enabled learners to do self-managed instruction. We have traditionally had face-to-face delivery but the same resources can be used in other ways. Also there are many internet resources that a trainee could use. In the automotive area in Queensland we have developed an interactive CD program that is achieving world acclaim. Students take one of these units from the CD and work their own way through the instruction in the workplace and, in doing so, solve problems collaboratively. We also offer phone support for students not in our catchment area. For students who wish to come to the college we supply them with whatever support we can there as well as to solve whatever problem they may have.

As these brief vignettes indicate, the introduction of CBT created a number of quite significant shifts in the patterns of teaching practice in vocational education: these include shifts from college-based, face-to-face teaching guided by the curriculum to an increased emphasis on assessment; diversification of teaching methods; an expansion of workplace delivery and assessment; increased responsiveness; a shift away from teacher-centred instruction; and an increased need for student support. These issues are addressed below.

Major shifts that resulted from CBT

So far in this chapter, the point that seems to be emerging most clearly is that teachers and others engaged in the world of vocational education and training perceive that the introduction of CBT heralded both continuity and change. In this section we are concerned with explicating the significance of perceived changes that have so far been identified.

Increased emphasis on assessment

One of the most striking features of the interview transcripts was that teachers talked more about their experience with assessment than content. Indeed, much of the interviews was devoted to explaining the processes and requirements of assessment. Teachers indicated that they did not think that CBT had made much difference to their teaching except in relation to assessment. When asked 'How did changes in the curriculum affect your work?', typical responses included:

> *It didn't. If I look at my department, things didn't change dramatically. It still hasn't changed. I get the feeling that when new documents come out they're just massaging—changing names. I see people still teaching the same material they always have. What* did *change was the way we assessed. We had to break the assessment down into smaller and smaller pieces. And that added an awful lot to workloads.*

> *Only in the form of assessment, but not in the training itself. We used to teach things in small parcels, and now we also have to assess them in small parcels too.*

Others indicated that the teacher sometimes got bogged down in assessment:

> *The main thing I saw change after CBT was that the students could retest or relearn and be reassessed. If they wanted to do it on an incremental basis, you often got caught in a situation where the teacher was just continually testing and wasn't necessarily dealing with the learning achievement. We ended up having to make a new policy on re-tests. Also the grading system changed, and that was hard for a lot of people.*

When content was mentioned, it was frequently referred to in terms of course accreditation; that is, assessment of programs. Teachers talked in detail about the way they had to comply with required formats, language and procedures in order to have programs accredited:

> *In 1992 we re-wrote* [the previous content-based syllabus] *and included installation. Installation wasn't in it originally because when we first wrote it the State instrumentality was doing the installation and we did the maintenance and tuning aspects. Then in 1992 I obtained funding to re-accredit the program and we included installation. The program went from being a 40-hour unit to a 70-hour unit, and the curriculum for that is very much stated in our terms.*

> *You had to use the ten principles (a specific format). We got it back twice because the language wasn't correct, and not back from accreditation but back from the preamble; we sent it to Richmond (Barton) they were the designated provider and we had to send it to them; and they sent it back and said "you need to scrub up the paragraph A, paragraph Z and whatever ..." which we did and then sent it away again and it went to a different person and they said "you need to scrub up paragraph B" ... sent it off and finally got it accredited.*

Diversification of teaching methods

The transcripts and focus group records indicate that there has been a great deal of diversification of teaching and learning strategies since the introduction of CBT. In this respect, teachers spoke in detail about the following:

- emphasis on practical teaching methods
- self-paced learning
- workplace delivery and assessment
- emphasis on record keeping
- teaching delivery using materials developed by others
- individual and group problem-solving
- teaching in teams
- technology applications
- computer-based assessment
- recognition of prior learning
- tutorial support for students
- an expectation that teachers will deal with a diversity of students using diverse learning styles and responding to different levels of literacy and numeracy skills
- individualised feedback to students

Expansion of workplace delivery and assessment

A central feature of the more diversified teaching and learning strategies used with CBT, noted by a number of teachers, was the proliferation of workplace delivery and assessment. In Australia this has resulted in an expansion of competency-based training and assessment in actual workshops and also the creation of simulated work contexts, such as in college-based restaurants or workshops in which students work on particular pieces of machinery. One Queensland teacher commented that workplace training was oriented towards learners' needs:

> *We have been involved in helping staff in that organisation develop enterprise-specific modules of learning based on the CBT concept. We had a staff member working almost full time at the site for 12 months. These modules were developed using the template put out by ANTA. They then became nationally endorsed descriptors and their staff were trained using those descriptors. This is one example, where training and assessment for the trainees was very much on-site, using their normal day-to-day production procedures. So it was all designed from the beginning to meet needs and it definitely fulfilled those needs.*

A Victorian teacher talked in more detail about the way work-based training has become an adjunct to college-based training.

> *Automotive won't go from something that is a structured process of three hours theory and five hours practice to what we consider to be CBT, where we might be doing work post evaluation, and we might be doing delivery at TAFE and it will be very flexibly organised. It's been pretty much that way. Work-based work and assessment will be the difference. In terms of delivery, the way that they have done it for a number of years now is different from when it first started but I think it still has the same sort of principles. One of the principles was for the student to learn the best way of doing things, and that was a pretty basic principle which we tried to stick to. It got to the point where, for example, we organised a deal with the local wreckers, where they would give us seven vehicles and they would put an advertisement on it saying 'this car was provided by xxxxx'. They would be changed every 12 months at no cost to the institution. You have to do things like that if you want to run a customer simulation; its never going to be a workshop.*
>
> *A simulation is different to a workshop. The vehicle does not need to go out by the end of the day, whereas in a workshop is a real car which belongs to someone. It is the second largest investment*

that they will make in their lives and you have to treat it with the utmost respect. This does not necessarily happen in the simulated environment because, over time, this vehicle's condition deteriorates. So when student Z gets it after everyone else has had it, it is not in the best condition. He has a better attitude than when it is a model, but the attitudinal thing is that 'it was buggered when I got it and when I finished the job it may still be buggered!'

As this teacher notes, in real workplaces, as opposed to simulated work sites, students have to adopt a more professional attitude and attend to customer's needs. A hospitality teacher emphasised the same point in relation to the TAFE-based training restaurant.

I think having more customers is going to make the students realise that it's not a picnic out there. However, in saying that, we have a lot more flexibility here. If we are not ready we do not have to open the doors for the customers so we can control the environment to some extent … You are never going to be able to simulate industry because customers ask out of the ordinary things. They do ask for dietary requirements but there are other things, if you are working in industry, that the customer asks for. In a way we have trained our customers to be kind and polite to us here.

Hardly surprisingly, this teacher indicated that if he/she could change teaching and learning arrangements to improve learning, he/she would deliver in industry:

Definitely deliver on-site … If I had my way, I would be delivering the basic minimum requirements in the restaurant here. I would run the restaurant as a commercial enterprise. I would hire people to actually run it but maintain a section of it purely for educational purposes. I would then have an arrangement with the hotel or restaurant and provide them with staff and you would then become a workplace assistant.

Shift away from teacher-centred instruction

An aspect of the diversification of teaching practices associated with CBT was the shift away from teacher-centred methods and towards student-centred approaches. Increased responsiveness to industry has meant that enterprises, if they wish, may select only the particular modules that they see as relevant in full training programs. Attempting to offer a range of choices to diverse enterprises puts enormous strain on any institute's resources:

The difficulty is for an institute, any provider, to be able to provide the comprehensive range that we've developed. The concept was that you'd have a teacher able to do flexible delivery and be a manager of the learning process as distinct from a presenter. But that's been a challenge for people out there because most of them have been in an environment where they were the source of knowledge and everybody focussed on them, to a situation where you've got to let people do their own investigation and research and support them.

Prior to CBT, the teacher was very much in control of when students were being assessed. If they were being honest and fair dinkum about CBT then the student was going to be the person who was dictating when they were ready for assessment. Some teachers had difficulty coming to grips with that because it's a major shift in the way in which they've managed their teaching and their classes in the past.

Increased need for student support

Some of the TAFE teachers indicated that the introduction of CBT had been accompanied by an increased need for support and counselling for students. Practices associated with CBT have highlighted this need but, a number of teachers maintain, financial pressures have resulted in reduced opportunities for pastoral care overall:

It wasn't until CBT that we started to introduce tutorial support for students outside of class hours, particularly in theory areas. Teachers were available to go over theory work and (in a few cases workshops as well) mostly in helping understanding of the underpinning knowledge required.

This highlighted that different students take different lengths of time to achieve outcomes. One of the problems with institutional learning is that it may take a lot of time for tutorial support. If it takes students too long to understand the material, then maybe they are not cut out to follow that trade. Self-pacing helps overcome this … Other areas where students need support are in managing their own learning. Levels of literacy and numeracy make it difficult for some students to achieve. If we are not testing literacy and numeracy in the modules they are studying, is it fair to require reading where an equivalent verbal or practical assessment may be designed? However, there are very few trades, which don't require reading manuals or interpreting designs.

Summary: Changes in the concept of teachers' work

In summary, the TAFE teacher histories and focus groups confirm the view that the introduction of CBT resulted in both change and continuity in the instructor's role. It led to diversification of teaching practices yet also confirmed a range of existing practices. It seems that teachers experienced the combination of continuity and change not as a revolution in vocational teaching but as specific changes in their practice. Their new practice, they say, differed in degree rather than kind from previous practice.

However, when teachers spoke about changes in degree and commented on their effects on their work and their occupation, they insisted that the range of changes add up to a profound revision of the character of their work. CBT has shifted certain work practices, such as assessment, in ways that have some clear continuities with prior vocational education assessment practices. Yet, what have also changed are the relationships between curriculum, assessment and teaching. This indicates that, as well as shifting teaching practices, CBT has contributed to shifts in the relationships and emphases between teaching and other aspects of teachers' work, and between teachers' relationships with students and other agencies, particularly industry. In other words, even though some teachers refer to a range of continuities in the details of their day-to-day work, it is clear that the context in which they work has experienced profound change and that the way in which their work is conceptualised, by them and others, has changed accordingly.

The implication is that the impact of CBT may be less evident in the tangible practices of vocational teaching than in its effects on the overall teaching labour process. These include a shift in emphasis in the work of teaching away from content and towards performance; and from reciprocal obligations centred in training to one-directional accountability centred in external regulatory bodies. More ambiguously, there has been a related shift from locally contextualised to more standardised provision of training. As one teacher noted:

Things have become impersonal—with students and others.

These changes in emphasis are not always acknowledged explicitly by teachers. Some teachers tend to see their work in matter-of-fact ways that present vocational education in a relatively mechanistic way. Others see their work in organic rather than mechanistic terms and tend to be reflexive about the way technically rational production models of instruction overlook the human dimensions of vocational education. The data reveal tensions between these different ways of seeing vocational education in its pre-CBT and CBT forms. Such tensions are revealed in the comparative comments that teachers make about their work experience and also in different teachers' accounts of their changing role within the context of CBT. The message is clear that the introduction of CBT changed some of the tangible facts of the matter in relation to vocational education. But the critical point is that the overt and easily-identifiable changes in teaching practices and relationships add up to a more comprehensive and intangible set of reforms in the teaching labour process. These reforms are examined in the next section.

Outcomes of the implementation of CBT

When asked to reflect on the outcomes of implementation of CBT, most respondents seemed unable to distinguish the impact of CBT from the impact of other associated reforms and social changes such as industry restructuring, budget cuts, privatisation, outsourcing and the impact of technology, all of which were occurring throughout the late 1980s and 1990s. This point is important because CBT, as we have emphasised, can be seen differently in relation to different aspects of the reform process.

For example, teachers commented that their teaching practices were being constrained because their work had intensified. This outcome is certainly associated with CBT, but for different reasons. To be sure, CBT entails detailed processes of record keeping, assessment and materials preparation. But it is also associated with budget cuts, new teaching technologies and flexible, self-paced delivery, and expansion of markets. All of this has resulted in teachers having less time with students and, in many cases, larger numbers of students per teacher. A metals teacher commented, 'I'm just not sure how [a teacher] would get around to do those assessments, to do the training, to do the knowledge background and some skills support'. The pressure for TAFE institutes to generate income has already been noted as a factor that can compromise teachers' attention to students' learning. Many teachers associated the introduction of CBT with an increase in paperwork. As one put it, 'There's a lot more record keeping now'. Another claimed, 'It's certainly been more administrative work'. Another, when asked what CBT meant to him, responded that 'If you ask any teacher here they'd say it meant a lot more paperwork'.

Other teachers maintained that it was difficult to distinguish the impact of CBT on their teaching practices from the impact of other training reforms. One teacher noted that the most significant changes were 'the implementation of self-paced delivery and rolling enrolments'. The important implication here, and one that we need to emphasise, is that self-pacing has shifted the emphasis away from teachers as experts who are central to teaching and made them resource people who facilitate student learning. This point was emphasised by participants across the full range of our sample.

Another teacher linked the perceived reduction in the role of teachers with funding cuts:

> *If the funding was sufficient to do the job properly, then we could have a very worthwhile system. But cuts in funding and CBT do not go hand in hand. They are diametrically opposed. CBT is an expensive system.*

A further teacher drew attention to changes in both working conditions and the autonomy of TAFE teachers since the implementation of CBT:

> *Well, we lost progressively. We had, in TAFE, a curriculum department which broke up into various industry groups and that progressively was downsized and emasculated. We set up consortia initially and they were based in State Office. They were delegated or devolved out to institutes when the institutes arrived. They were still actively involved in setting up the curriculum but more as a unit functioning for the ITABs, sub-contracting to the ITABs because they, ITABs, didn't have the expertise.*

He concluded:

> *I'd like to see more teacher control over the curriculum. While it's good for industry to have it tailored, I'd like to see more general subjects that cover a broader area than just the particular enterprise. We do some of that, but maybe not enough.*

Of the many people involved in vocational education and training with whom we spoke, some acknowledged that the introduction of national standards embedded in competencies is 'a big advantage'. But many of them also lamented what they

described as restrictions that simply made their jobs more difficult. For instance a common complaint was summarised as follows:

> *Limits to funding and time make it difficult to resolve issues in the competent/not competent system as students should be able to repeat assessments.*

The point here is that many teachers, in particular, but also industry personnel, are not confident that a one-off demonstration that a student can perform a task necessarily indicates the student is competent in the task. Moreover, the emphasis on the ability of students to perform specific skills, according to several respondents, is especially concerning if the skills performance is not supported by an educated understanding of the nature of the skill and its part in a complex array of other tasks and processes. In one of the focus groups the point was summarised this way:

> *In the past* [TAFE] *was about educational training plus skills training. Now it's only about skills training so the end product is not as high quality.*

There was less agreement about the effect of CBT on students. For instance, one view emerged from focus groups of regional and metropolitan, TAFE and non-TAFE metals teachers who maintained that 'for the good students, the changes have been terrific, but not for the at risk students'. The problem, as these groups confirmed, was that only a minority of their student cohort could be described as 'good'. The implication is that, in fact, a majority of students have been disadvantaged by CBT.

In contrast to the view above, one respondent who is a non-TAFE teacher in the hospitality industry was adamant that, because CBT established minimum standards, these standards could more easily be reached by a greater proportion of students than could satisfy the more subjective standards set by teachers in the past. However, this respondent also expressed the view that the setting of minimum standards, although it has introduced greater objectivity into assessment, had also led to a general diminution in the overall level of skills that were being taught and assessed in the hospitality sector.

In concluding this section, the key finding suggested by the data is that, while the instructor's role has shifted in relation to teaching practices, there have also been less tangible changes in the relationships between teaching and other aspects of the teacher's work.

These latter changes have had effects in the teaching labour process and the way educational work is done. It seems significant that, while teachers expressed concern at some of these changes, particularly in relation to the kind of learning outcomes that were being achieved and the sort of learner that was being produced through this teaching labour process, they also recognised that there were benefits associated with CBT. Some endorsed the trend to more standardised training provision. Others identified benefits for students, particularly less able students. Many commented on the benefits to industry. However there was also a sense that the patterns of CBT reform were changing. This last point, we believe, is extremely important in understanding the impact of CBT on the role of instructors. It is essential to recognise that, in addition to CBT being interpreted differently by different people in vocational education and training, CBT has also meant different things at different times as the reform trajectory has continued.

Changes in the nature of the teaching labour process

So far in the data analysis for this chapter we have concentrated on pre-CBT teaching practice and the impact of the implementation of CBT on teaching practice in general. That is, we have been concerned largely with the functional elements of what teachers

do in their daily practice and how various respondents think these have altered in response to CBT. In the previous section, however, we also began to emphasise the essential point that major reforms such as the introduction of CBT will inevitably have much broader implications for teaching than just influencing details of teachers' practice. Such reforms also play out in the ways in which teachers operate within, and relate to, broader organisational and institutional structures. Such changes, as we discussed earlier, can be regarded as changes in the teaching labour process, and they were evident in respondents' descriptions of their work. Significantly, changes of this broader kind were most frequently referred to when teachers responded to questions about their concerns about their role within the CBT framework. We address a number of the main concerns below.

Curriculum

Some teachers indicated that the introduction of CBT had led to a reduction in curriculum coverage. They were concerned about this. For instance, two hospitality teachers indicated that students now received no training in some areas. According to one of these, 'Trainees are now lacking silver service, gueridon and flambé work'. Another stated:

> *We don't train to fine dining anymore, but we attempt to give them the very best—to level five or more, but most come out at level three. Most students are very basic—you get your stars--but if I'm teaching someone I only give them the basic* [theoretical] *knowledge.*

Others argued that the 'less tangible', or more difficult to quantify, aspects of training were not being addressed sufficiently within the CBT framework:

> [CBT has] *always been very much based on tangible results in that area; customer service aspect of it is something which is fairly intangible, in that you can train students to keep their own natural personality, and that is a very hard thing to gauge and its something very hard to teach. You can teach the principles but I think it is very difficult to teach the manner to approach customers which is a very, very large part of that area because we do serve a lot of customers.*

> *I think for those people who were teaching theory subjects, they weren't too sure how to formulate it into competency-based assessment, whereas* [in] *a practical subject it is very easy to perform a competency-based task.*

Another teacher commented that industry increasingly sought soft skills but that these were precisely the kinds of less tangible outcomes that were difficult to measure and which, according to a range of respondents, were typically not included in CBT-based training programs. This teacher illustrated the point in relation to an aspect of metals training:

> *More and more today employers are becoming a little more critical. You may have that qualification but they would also have a list of things that they would want you to have. One of those things would be customer service. The soft skill stuff. A lot of the places you now go to, such as General Motors, would like you to have those things and, if you don't have them, they would like you to obtain them. So it is not just this qualification, but this qualification plus the experience or additional learning or whatever.*

Making a related point, a Queensland teacher indicated that as the curriculum had been reduced it had become atomised to a meaningless degree:

> *You break things down more. We used to do that before CBT. When we had information or training sessions in CBT they were taught by people who, I felt, didn't understand CBT themselves ... We had a whole day session once—take the example of opening a bottle of wine. We didn't get any further than the cork because the trainer said that it's no good opening a bottle of wine and serving if you don't know what the cork's made of. To me that's ludicrous—that's*

going way over the top. That guy had taken the breakdown too literally. It turned a lot of people—certainly me—off CBT.

Resources

Managing teaching resources had also become more complicated according to many informants, particularly as students now had to demonstrate their competence in relation to specific tasks:

> *CBT was very expensive, especially in cookery. If for some reason you had to give a tick in a book for a roast leg of lamb, then the ideal was that you had to give every student in the class a leg of lamb to roast. And then discussions came in about how many people could roast a leg of lamb. If one person stood there and baked it and somebody else put the salt on it and somebody else put the pepper on it, and someone else switched the oven on and someone else actually opened the door and put it in, then how many students could you give ticks to, based on this one leg? We started to get into the situation where you couldn't afford* 14 *legs of lamb for* 14 *students and the problem starts. How do you overcome it? Certainly our college was loath to get into six students handing around one leg of lamb and all getting a tick for it (i.e. three legs of lamb per group). We were saying if a student couldn't do it on his own then we shouldn't be testing it. But what happens when we come to the end of that block and he hasn't done things because we can't afford it? We have heard of other colleges where that actually happened but this college fought hard and long and have only just recently lost the battle. We are having to modify our view to suit the economic situation.*

In metals, a teacher commented on a similar problem—how to provide sufficient car parts for students to demonstrate their capacities in effective repair:

> *Any bit of car is not designed to be taken apart and put back together a thousand times because threads strip, bits break, so you have to try and cut costs because with this style of training the expense is very high.*

Such pressure on teachers to acquire the resources necessary for them to conduct meaningful assessment has encouraged institutes to move toward engaging their students in workplace experience and workplace assessment. For example, as part of their assessment third year automotive apprentices have to dismantle and reassemble an automatic transmission. It then has to be tested to ensure that it operates as the manufacturer specifies. But if a student was working in an automatic transmission workshop where he/she repairs automatic transmissions all day, then the practical demonstration of competence could be assumed by the teacher if the student provided documented evidence of adequate performance from his/her place of work. This would then leave the trainer just to assess the knowledge areas. But such a scenario also raised further questions about how employers should document student performance and the extent to which teachers could trust employer assessments. As a metals teacher put this point:

> *Some people seem to have some concerns about* [employers' assessments] *because it is an assessment done by a remote agent and TAFE is giving the credential, and I guess there are reasons for concern. However, if you take the metals industry, the current competencies of that person are really what determines what category they are in the scale of things. Unless an employer wants to get rid of a person, because they are terrible, I don't think* [he] *is going to give someone credit for something they haven't done because it is money that is coming out of their pocket. The opposite to that would be to get someone who is quite mean and nasty as an employer* [who] *may hold someone down. But I think there are services available that the employee can take grievances to.*

Management of teaching

CBT, most respondents agreed, has had a profound impact on the *organisational* aspects of teaching. One teacher commented on the way teaching had become 'broken up'

between groups of teachers with students moving from teacher to teacher in order to obtain the necessary knowledge and skills. This 'conveyor belt' approach to teaching, it was argued, required careful organisation of teaching sites because each site could only accommodate a limited number of students. The teacher explained:

> *It's more of a control aspect today, because in the past it was up to say myself as a teacher. I had prepared my lessons I would go into the classroom and deliver my theory. We would then do the practical aspects of the program. So I was in control of those 13-14 people for an eight hour period. Today that is not so, today those students will see a number of teachers; say for example, there will be* two *in factory A,* three *in factory B there could be* two *in factory C; so they will see any one of five teachers. Because they will move from factory A where suspension is done to factory C where cooling systems are done, so they are going to go with a different teacher. That teacher has to have a co-ordinated relationship with teachers in the other areas and it comes back to students per group. Because everyone has to do a module which is in factory 1 it is no good sending everyone down to factory 1 because there is not enough room and there is not enough teaching staff, but that is what happens sometimes. It's not easier than a teacher-centred approach; it is more difficult in this process because of the multi-activity style.*

The point that needs to be emphasised here is that the co-ordination and organisation of teaching has become more complex and makes greater demands on teachers' administrative and organisational skills.

Student: Client priority

Some teachers indicated that they faced dilemmas when working in actual or simulated workplace learning environments about whose interests should be served. A Victorian hospitality teacher commented on this in relation to the college-based restaurant:

> *Management are very keen on getting financial aspects* [of the restaurant] *up and running, which I can understand … Sometimes I think how much of education is actually being learnt, because we are so busy with our other customers, i.e. paying customers (from outside), that the education aspect I believe is sometimes lost.*

Student motivation

Two teachers indicated, quite explicitly, that they felt that the non-graded character of CBT assessment reduced students' motivation, and that working with less motivated students affected their own teaching practices:

> *It's the assessment, the motivation. I cannot believe the number of students who come here, and in the first week they'll ask, 'When can we have a break?' I guess that's just the culture today. But we have people who come here by choice. I don't know whether the learning by the young people here has improved. We have older people in our courses and some of them wouldn't miss a class because they know why they're there and you wonder why some of the young people don't know why they're there. Last year we started with a group of 15 and, as the course progressed, only five would turn up for the restaurant class. I would have thought that would be the best part of being here. I went to another college for dinner and the students were awful, and before dinner the teacher came out and said, "you'll have to excuse the service tonight because only four students turned up". So it wasn't just us! It's the students.*

This teacher continued:

> *In CBT they either do it or they can't do it. They either pass or they fail. And we have students who are very good and try very hard and at the end of the semester, someone who turned up when they felt like it, did what they had to, and they got the same mark. And there's no way of distinguishing someone who is very good from someone who is very bad. The problem is if you don't get it right you try again. The perception is that everyone will pass.*
>
> *The system is now more unproductive than productive, because CBT curtails the competition for one person compared to another. It takes a lot of incentive for students to perform above the norm*

... Career development is inhibited because people are content with Js, rather than striving for honours as they used to.

Student learning

The flip side of teachers having to deal with demotivated students was that some teachers believed the CBT approach provided enhanced opportunities for lower achieving students to learn. One said, 'I think that this system has allowed everyone to achieve at least some outcomes as opposed to pre-CBT where if you failed you tended to be a "failure"'. However other teachers were less sanguine about the beneficial learning outcomes associated with CBT. Time was identified as a major factor. For some teachers, the problem was that they now had reduced time with the student because of work intensification:

I just find that I don't have the time, as in personal time [for working with students] *I think the focus is more of generating work than establishing the student, we have no time to establish the student, because before it was a little bit what the customer requires, I think they want the end product; that being the student to be as competent as they can be, but I have to ask at what cost.*

For other teachers, the problem was that the students had shorter time in their course and, as a result, less time to learn:

TAFE is hell-bent on reducing the number of hours of face-to-face training. As such, I think we are disadvantaging the latest groups of students that come through. When I was in training at college, it took two years of college time to produce a qualified cook (that was in the 1960s). I imagine that was a very expensive way of doing it. We have just moved now to producing a qualified cook (I don't mean a tradesperson) in six months ... It seems to me that is because of economic concerns. I am sure that they are in no way the same as the cooks we were able to put through in a year or, in my case, two years. There is so much growing up to do at that age.

This teacher continued:

I am not convinced that CBT has produced a better product, but it is not all bad. [The problem is] *we can't afford to keep kids for any length of time. We can't afford to grow kids.*

Focus group participants also supported the point that CBT has been associated with a decrease in student support due to funding restrictions and the pressures of time on teachers. As we have indicated, there was also an argument that, at a time when student support was declining, there was greater need than ever for increased support and counselling because of the emphasis within CBT on self-pacing and self-managed learning.

Teachers recognised that CBT had increased the need to formalise learning outcomes and to work towards specified standards. However, some also felt that it was inappropriate to term the outcome of a training program 'competence'. This was because, they felt, competent performance could not be guaranteed and, in any case, the development of a well-rounded tradesperson required time for learning in the industry which would supplement raw skills and contextualise competence within the broad requirements of the profession.

One teacher linked this point to the standardisation of assessment:

I have a real problem with saying that they are competent because, for example, hanging a door ... I may have observed someone hanging a door and everything fits. I mean the room was square to start with everything was in the right place so the student could have the best possible go at it ... But realistically, what does the industry see as competence? The industry sees that that person who is qualified to hang a door, can hang a door anywhere, under any conditions whether it be raining, midnight, whatever, and [that they] *can do the job.*

Another noted:

In theory CBT should be right. The employer should be able to look at the report and say, 'oh he can do that, and that, and that'. The problem is he may not be able to do it. He can do it three times and be not quite competent. How many times should they be able to do it before they become competent? They eventually become competent but then they go into the industry and the first or second time they try it they don't get it right. XX from TQ [Training Queensland] *says that no-one is competent when they leave college … The more I think about it the more I think he's right … you hear people say 'wouldn't have TAFE people'. I've got a very good friend who runs a restaurant and they never put TAFE students on. They take new people and train them themselves—they like people with attitude.*

A metals teacher in Victoria offered an even more ambiguous assessment of student learning. He suggested that teaching produces not only learning outcomes but also particular kinds of people. With CBT, he maintains, students are formed in a more impersonal way than previously:

I think that the students they pass out today in terms of completing an apprenticeship have a couple of differences one of them being that now the apprenticeship is so much shorter; it's three or four years at TAFE whereas previous to that it was five *years; a day and a half off the job. The topic area is less because of the changing structure of industry. In terms of an overall learning process I think it is less but that is not saying less as an outcome. I think that the students we see leaving today are equally as good, I won't say better, as those students who graduated before them, even in the four year system, which was common before '83 – '84. The outcome is different I think. The students, when they leave today, are probably more prepared for what goes on in industry than they were in say the late '70s. But I think that the process of the training is very impersonal. To say to someone that you are responsible for your own learning has an effect on people … I think the outcomes for the two different groups of people are different I don't think one is any worse than the other. If the outcome, at the end of the day, is a rounded tradesperson then I don't think that what we currently do is going to give that. But I don't think that is the fault of CBT.*

Teachers also noted that industry had responsibilities in the development of tradespersons:

In the original concept of CBT both on- and off-the-job assessment were supposed to be introduced, but very little on-the-job assessment was actually done. Employers felt that if employees had been to college they must be competent, but it may have been incorrect to assume that 40 hours at college would enable students to be fully competent on the job. We may need (under the new system) to allow for further experience and assessment before signing off in the workplace, (although those who have been working may be able to be signed off more quickly).

Competence is not only what the student learns. It is what is learned in the industry, rather than the institute. A lot of employers today have this attitude 'make them qualified as quickly as possible', but I am not sure that it is beneficial for apprentices. When I did my apprenticeship I had an extremely good boss who I considered to be before his time … He would give me the opportunity to do things very early on in the process, whereas I don't think that happens today. I think you find it more sweep the floor, make the tea and, I think, that is impacted on by the structure we have in industry. I was treated as a person not a number and, if we can get somewhere like that in TAFE, then we have a chance. But while we go down the path of CBT, or what people envisage as CBT, *I think we are going to have a problem because it can be very impersonal. I think maybe what we get now reflects what the industry requires.*

Another teacher wryly commented:

What I would like to see is a longer time in college. As I've said before, I really should be a head transplant surgeon—putting old heads on young shoulders. That can only be done with time and therefore the idea of condensing courses to a minimum time actually stunts student learning.

As this range of responses indicates, organisational change confronts established organisational/institutional cultures and those who live them. Some find ways of adjusting by renorming their work in line with new organisational and institutional commitments and expectations. Others exit, either by privatising their work or by leaving their jobs. The upshot, through revision or attrition, is that there are shifts in the organisational culture, although this rarely resolves debates over meaning because these debates are rooted in institutionally-grounded normative frames rather than in organisational practices that play out at the corporate level.

The trajectory of CBT

The trajectory of CBT has developed, through the CBT decade, in a contradictory way. On the one hand CBT reform has enabled greater standardisation and uniformity of teaching. On the other hand there has been a variety of counter-processes which have pressed towards increased diversification of CBT. These contradictory trends are outlined in this section. Responses to these trends are then documented and their limits examined.

Effects on teachers and teaching: The trends

Among the trends identified in the data were the following:

Standardisation of teaching

A continuing theme running through the TAFE teacher histories was that the implementation of CBT provided a means of standardising the curriculum and assessment of vocational education. There was a feeling that, pre-CBT, students could experience very different kinds of teaching and learning because of the variability of pre-CBT curriculum and assessment. As a Queensland hospitality teacher commented about the pre-CBT era:

> *If we have a problem, it is that teachers teaching different groups would not assess in a similar fashion and certainly different colleges would not be assessing in a similar fashion.*

This teacher noted that the introduction of CBT was seen as a way of addressing this variation:

> *What was changing ... in our own industry was, I suppose, that we were looking for a better way whereby we got a more standard product from all colleges. We were trying to ensure in a fairly cheap (inexpensive) way that we got a more standard product from all colleges, rather than putting an assessor or inspector out to check.*

One teacher summarised the means by which this standardisation was achieved:

> *CBT has assisted in maintaining a standard for industry. As the module descriptors were developed by national curriculum advisory committees, the learning outcomes and assessment criteria were endorsed by industry representatives thus ensuring a minimum industry standard. An exchange of assessment instruments across States and Territories has also ensured consistency of standards.*
>
> *In terms of student achievement the biggest change is from a graded to a J/M system. Because CBT is not time based and students can retest, the question has arisen as to how many chances at a test a student may have. We've adopted a procedure of allowing three attempts before students have to re-enrol.*
>
> *Another thing that seems to have happened is that there's a lot more record keeping required now.*

Despite these regulatory mechanisms, some teachers felt that the introduction of CBT had not produced a standardisation of curricula and assessment. Two teachers

put it bluntly. When asked whether there was greater uniformity of provision with CBT, they said:

> *It hasn't—not in our area. It may have in the cookery side, but here it hasn't.*

> *It hasn't been achieved. Unless you put in a moderation system and check what's going on, how can you say it's uniform? Like yes, the curriculum might be more uniform in terms of definition of standards and performance and content. OK, that's defined clearly, but you're going to be subject to individuality unless you go and do a moderation process. Every person who delivers xyz has to get together and look at the assessment instruments, the results you're producing, the content and use that in moderation to see whether you've got variations of highs and lows and then feed that back so all players involved get that information and can, if they agree with it, follow it or adopt it. But that's not going to happen because who's going to spend the money?*

Furthermore, there were mixed views about the significance of the amount of variability in the system. In the pre-CBT context, variation in teaching and assessment was seen as a problem when it involved teacher's introducing biases into their teaching or being unduly swayed by subjective assessments in evaluating student performance. But it was also valued as a way of tailoring curriculum and assessment to the particular needs of individual students, regional communities and enterprises. With the introduction of CBT, there was recognition that, in some respects, diversity was being mandated alongside uniformity.

Diversification of teaching

As the last teacher quoted suggests, there may have been a standardisation of curriculum and assessment under CBT, which are key regulatory mechanisms defining the teaching labour process, but this still does not guarantee standardisation of teaching and learning. Variability still exists partly because teachers are the human factor within any instructional technology, including CBT. Such humanity is the essential ingredient of the student-teacher relationship, which rests on teachers' personality, individual attributes and sense of engagement with students. Variability also persists because the teacher works with students who have diverse approaches, attitudes and requirements in relation to learning. In addition to these sources of variation, training reform has mandated that teaching be responsive to industry requirements at a time when industry is operating in a highly volatile economic context. Industry demands have also shifted as the decentring effects of enterprise bargaining and other deregulatory reforms have gathered pace. All of these forces have effects both on teachers' practices and in the wider teaching of labour process.

As noted above, most of the teachers reported a diversification of teaching practices since the implementation of CBT. These shifts in teaching practice were seen to be a consequence of increased provider responsiveness to industry, students and to their own changing work conditions.

Responsiveness to industry

The implementation of CBT was associated by respondents with a shift of responsibility and authority for training away from TAFE and educators, towards industry. Training was to be an industry-driven system. A teacher summarised how colleagues perceived this shift:

> [It was] *a major culture change … The fact that the competencies were related to an industry standard was a major change … There is* [now] *a need for more constant communication with employers and industry. We have now to be more receptive to the individual needs of trainees. We are now more accountable to industry and trainees in terms of the products and the claims about the products we deliver. We have to be more accountable to the purchaser of training and*

the trainee and more accountable to national bodies like ANTA. We show this accountability through paperwork for registration and accreditation at a government and an industry level. We have to comply with MERS ITAB's specifications to get that registration. To our purchaser, it's now a fairly rigorous process to justify our ability to deliver to a minimum standard at a competitive price. In terms of our accountability to the employers and the trainees we have to be more accountable and open to scrutiny under the freedom of information legislation etc.

There are clearly now multiple accountabilities for teachers and training providers. But the upshot of increased provider responsiveness to industry has been that, as one respondent put it:

Enterprises are getting the training they want, geared to how they want it.

Another respondent summarised the point this way:

Industry is only wanting to utilise us to their own benefit. That's the real issue. When we had a two percent levy we were inundated with requests for our staff to train. When the levy dropped off, so did the training.

Another teacher was sceptical of industry's role in CBT. First, in terms of actual people, the category 'industry' was perceived to be 'pretty narrow':

Industry is a very narrow group of people. You see the same names coming up in every document you read. In the last couple of years I've read some reports on what employers think and the two questions they ask most often is 'What is CBT?' and 'What is industry?' Industry doesn't have as high a profile as they'd [i.e. regulators of training] *like to think.*

Secondly, while industry is supposed to be driving training reform, industry is seen by some participants as being relatively invisible:

I go to TTQ breakfasts but it's just inundated with training providers—very few industry people there at all. We do network though, to some degree.

This teacher accepted that industry had legitimate interests in training but wondered if the national modules did attend sufficiently to localised industry concerns and, in any case, where these modules came from.

If industry wants a certain thing then industry should aim to get that. We have a national module system that comes from somewhere, but it doesn't necessarily take account of the local interests. I'm not sure who's involved in putting the curriculum together.

Others echoed the concern that, despite mandation of industry-driven training, there was plenty of anecdotal evidence to suggest that industry was not getting what it wanted. Employers, some respondents asserted, were seeking employees whom they could train themselves. One Queensland teacher stated:

Certainly I don t think industry goals are being met. It is unfortunate that you can't meet the guy from [a particular hotel chain] *... He is quite dissatisfied with CBT and with TAFE. He runs one of the most corporate restaurants in town and recruits from interstate and sees a wider range of apprentices looking for employment. Most other restaurants in town don't regularly recruit from other places whereas* [they] *will bring people from Cairns and from New South Wales. As such,* [their recruitment person] *gets a better view than one who just recruits from the local paper.*

Another teacher expressed reservations about training responding to industry by arguing that trainers must educate industry about the benefits of training. The diversification of teaching strategies and responsiveness to industry may facilitate processes to enable such education. A particular point that was emphasised in this

regard is the presumed long-term benefit of broad training that contributes to the creation in industry of a training culture. Within such a culture there would be commitment to ongoing learning in a broad sense rather than to just periodic skills updating. One teacher commented:

> *If CBT is implemented in a correct or most appropriate way there can be plusses for all (industry, trainers and trainees) and if we take full advantage of all the processes available (RPL ... accelerated progression, workplace assessment) then it can be productive for all ... That's going to require ... fairly extensive education for industry. Where an industry doesn't see training as part of its core business, but training is seen as a cost. Industry needs to be educated to understand that the potential for increased productivity can be achieved through training. However, training may not be productive in the short term and is difficult to implement when dollars are tight.*

Responsiveness to students

Some teachers indicated that the diversification of teaching could be seen as a response to a changing student populations. For instance, the following points were made in the teacher histories:

> *I feel that people who have come through this institute have changed because of societal change. In my day very few people went to university, we all got trades. Now they'd be going to university and they wouldn't be doing trades. So I think the people we're attracting into our trades into TAFE, their natural academic abilities, are different. And I think we find it harder these days to get the same performance out of a lot of our general courses. And you find that in an average class there are more problem students than good students. A lot of them are finding self-paced learning hard.*

> *We've seen students come in with low results from high school and they've been able to undertake a module based on CBT. We've been able to identify low literacy and numeracy levels. Under the old system with essay type answers, I have a feeling we may have been tied up in their inability to write a comprehensive sensibly constructed response. We've tended to look at spelling mistakes. But now, because we have to focus on an outcome with set standards and that, we've also realised that we could assess using different strategies, we have recognised that these students had the skill or the competency required and could demonstrate outcomes even if they couldn't express them in words.*

On this last point there were different views. We have already noted that some teachers believe that it is difficult for some students with literacy problems to express what they know and to receive satisfactory assessments because the self-paced programs and assessment formats have become increasingly text-based under CBT. There were also mixed views about whether students were or were not able to cope with the diversified teaching associated with CBT, especially self-paced and self-managed learning. As noted above, there was some unease amongst teachers that students were being disadvantaged by these individualised methods because they were being introduced without sufficient student support.

Responsiveness to changing work conditions

The extent of diversification in teaching that was evident in some TAFE teacher histories indicates that there is willingness amongst TAFE teachers to change their practices in response to student and industry needs. One teacher made this point explicitly:

> *Unlike pre-CBT, teachers are more sensitive to moderate, monitor and improve their own assessment practice. They are more aware of different learning styles of their apprentices. So they are more willing to modify assessment to suit students, unlike the old system of centrally set exams for everyone regardless of literacy and numeracy levels.*

But others saw the willingness to be flexible as a consequence of other changing work conditions. One teacher said that his work had:

> *... not only changed because of CBT. It has also changed because of the economic considerations. But CBT has made it more tedious from dotting the i's and crossing the t's, or giving the ticks and flicks. We are finding now we haven't got the time that we used to, to do extra-curricular work. To give an example, in the earlier Associate Diploma courses, we had sufficient time to do week-long industrial visits. We had sufficient time to do shows, competitions, fund-raisers for competitions. The lack of funds necessitates shortened classes. (I found out today that I'm going to deliver in 38 hours which on paper should take 78 hours, so I'm also going to have to devise 40 hours of self-paced learning and it's still not enough.) So, basically, I'm working longer hours.*

A Victorian hospitality teacher suggested that the pressure for income generation from the TAFE institute, coupled with staff reductions, had resulted in massive intensification of work. This teacher put the following view:

> *I think that those people who suggest that they have CBT, come actually down into the restaurant. They would see that there is not much CBT going on at all because we are managing paying customers as well as students, so the role of the teacher has changed a lot, I feel, I have seen it evolve over ten years, I cannot remember being any busier than I am now. We used to have two teachers on, one taught the food aspect of it and one taught the beverage aspect of it. Now there is only one teacher.*

Shifts in employment conditions have also encouraged change. The expansion of sessional and contract employment meant that there was a wider range of people involved in teaching and assessment. This increased diversity has necessitated reforms because common understandings about good practice in teaching and standards of performance that became established in relatively small and stable groups of teachers could not be maintained as those groups grew. It was not possible to quickly induct newcomers into cultural understandings because such understandings were not explicitly stated and took time to develop as tacit understandings. Such understandings were embedded in collegial norms and mores that, for insiders, defined the teaching profession. Within such an inter-subjective values framework, one that was not explicitly stated but was 'almost stated', good practice could be asserted and locally negotiated amongst colleagues. An experienced teacher explained:

> *When we had a small group of people where we knew each other fairly well; then our level of what we considered to be a tradesperson was not stated but almost stated. Everyone I think had a picture of what they were required to do. Whereas when you got into the apprentice training area, you had sessional teachers coming in and different levels of teachers in terms of full-time* [and part-time] *teachers. I'm not saying that people were wrong but ... the standards may not have always been accurately set. So yes it was very judgemental, you judged the student on your 'my' knowledge, not necessarily on the knowledge from the group of people in the workshop.*

The continuing changes and increased pressures also encouraged some teachers to develop strategies for dealing with change. Different categories of teachers had different scope for development. One said:

> *I think you would find that technology does have an impact on older members of staff, not necessarily new members of staff because most of the younger members are appreciative of computers (because they have one at home), they are appreciative of electronics, they see that that is a means of controlling today's vehicles and that's what you have to live with. Whereas older teaching staff members (I don't put myself in this bag), some of them are 'why are we doing this—we still need to teach the skills and the knowledge?'*

Others were forced by the introduction of CBT to reconsider their personal survival strategies at work. One explained:

I suppose what a number of them did (and in my view this is what a number of them are trying to do now), instead of moving forward and embracing the new and maybe looking at what good points they can bring from the old system, a number of them tend to be saying, 'How can I readapt to the new so I don't have change my old ways?' I think that happened at every set of changes.

Continuing uncertainty at work has become a big problem for some teachers to deal with. Their uncertainty arises from the difficulties of implementing training reform, increased competition in the training market and lack of security in their jobs. As a respondent indicates, once the uncertainty sets in, it can seem pervasive:

Uncertainty for teachers filters back into home life, as does instability in Queensland politics. Another factor has been private providers. TAFE people feel threatened in terms of job security.

The ongoing changes have been so extensive that some teachers decided to reconsider their employment and leave the profession. Such a decision is well-understood by surviving colleagues still in the system, as the following comment indicates:

Firstly there was no repetitive delivery in most instances. Secondly each day you were required to present new work and some teachers had great difficulty in coming to grips with that. So a number of them left the service and looked for other employment opportunities.

The dilemma of standardisation and diversification

While individual TAFE teachers have responded to the introduction of CBT in a variety of ways, the data suggest that there have been two major organisational responses. The implementation of CBT redefined both teaching practices and the teaching labour process in TAFE. While there were continuities, teachers had to develop innovative teaching practices and experienced significant work intensification that arose from both the novelty of, and the sheer demands associated with, the redefined teaching labour process.

One organisational response to these complex pressures has been to pursue a more flexibilised and individualised teaching labour process. This strategy is particularly evident as an intensified pursuit of responsiveness to industry and students. It privileges individualised student learning while also seeking to contain the costs of individualisation through more extensive computerisation of teaching and assessment. Making curriculum and assessment more flexible flows over into flexibilisation of teaching. One strongly held view among our informants is that, under CBT, the teacher merely instructs, using curriculum materials developed by others and, in some cases, even handing over the assessment of student outcomes to others. In other words, this strategy is essentially Taylorist. A Victorian teacher noted:

If we look at the preparation of that (teaching) *material, then that single entity teaching staff member may not have had any input. It may have been done by a couple of other people two years ago.*

The second organisational response to complexity is not to ignore the possible benefits of flexibility but to take a more cautious approach that recognises the practical limits of flexibility. This approach leads to what has been termed 'holistic competence'. Some TAFE teacher histories indicated that instead of pursuing the flexibilising trajectory, teachers managed the contradiction between standardisation and diversification, and its accompanying work intensification, by recognising the broader character of the vocational expertise into which students were being inducted, and the vocational and pedagogical role of the teacher in enhancing student learning.

As a hospitality teacher noted, when CBT was first implemented teachers took seriously the need to tick off every single competence:

We went through reams of paper. In those days in cooking these chickens, we would have checks on all aspects, say for preparing, seasoning, basting, roasting etc. It was the idea that the kids didn't pass until each of those competencies was ticked off. They had to have a tick in every box to achieve competence. In other words we went from the holistic—can students cook chickens?—To the very specific—did the student truss the chicken in the right way? Did the student season the chicken in the right way? Did the student baste the chicken in the right way? The amount of paper was just unbelievable.

This attention to detail created huge workloads for teachers. By 1994, however, many of them had adopted a more holistic approach to the measurement of competence. CBT was changing and attitudes to CBT were changing. Another Queensland teacher confirms this point:

[With CBT] *I think there was more frequent assessment and more progressive assessment as individual tasks were assessed. And that in itself brought about more reporting and more paperwork involved in completed tasks. Students became more aware of assessment processes taking place and being used. Obviously there was more frequent feedback on achievement and more practice when they were unsuccessful and revision and reassessment before moving on to the next task. One of the dangers was that there was probably too much assessment. Instead of an holistic approach to a particular outcome, there was fair bit of concentration on details of a particular project. Also teachers felt that they had very limited license in how they could assess and the standard required. They tended to believe that what was written in the module descriptor was gospel and there was little freedom. As time progressed they saw more latitude and have been able to adapt assessment practices to suit the individual.*

A Victorian teacher is quite clear that, despite the official version of CBT, the pressures of work forced a move towards a more global assessment of competence:

You physically do not have the time to close the restaurant down and go through with each person task after task and assess each individual in a time spot for example. It's coming back to the opening times of the restaurant where there has been a budget where they expect a certain revenue and if the restaurant gets closed they of course don't generate that revenue. So while its more of an holistic approach, we are still producing competent students.

The two organisational responses to the contradictory implementation of CBT discussed in this section—towards Taylorism or towards holistic competence—both acknowledge the necessity of change and the benefits of some increased regulation of training in order to standardise provision alongside some increased flexibility to tailor training responsively to industry and students. Where these two organisational responses differ is in their view of the limits of flexibility. We take up this point below and return to it in the conclusion to the chapter.

The limits of flexibility

The TAFE teacher histories, in particular, highlighted a number of limits to flexibility. We discuss below the nature of the limits mentioned.

There are limits imposed by the *process of change* because, as the teacher quoted below notes, the process of implementing CBT was driven by government before other parts of the training system were ready to become fully involved. Industry standards were rapidly introduced because they were deemed necessary by government in order to provide some standardisation of the system as a whole. But individual enterprises still wanted flexibility in training so particular training needs could be met. The sheer complexity of the process, the contradictory pressure for both standardisation and flexibility, and the differences in interests, put limits on the amount of real change that could occur and also on flexibility. The teacher argues:

Well, we're working to their (industry's) *tune. I don't think it's perfect by any stretch of the imagination, because I think where CBT started, in the metals area, they wanted the workplace*

competency standards in place but they didn't have the time to put them in place. The government agenda was too fast so the TAFE colleges developed their curriculum first and usually from cut and shut. They had a CBT curriculum in place that was based on previous traditions. So we put in place a training program that dealt with knowledge and people picked from that. There were electives and there was a great machination about what should and shouldn't be. Now, industry is such that, in your apprenticeship area they're about to put in workplace competency standards. These competency standards are supposed to define the skills and practices and the performance of those practices that are relevant to a range of industries. If you look at the metal trades competency standards, you'll find that they are very broad, so we need to start going into them and trying to develop performances that address the competency standards but satisfy the needs of that enterprise. And we're going to find that with different enterprises, their needs will be different, but the competency standard can still cover for that, so you start worrying whether by putting a competency standard in it's not too prescriptive because if you make it too prescriptive you cut out the flexibility. You can't say everybody who's a boilermaker or electrician does exactly the same thing all day every day. And you can go down to the different companies and say they're identical. Well, they're not identical but you'll probably find that there's a lot of commonality amongst what they do.

There are *political limits* to change and flexibility because each agency wants to ensure that their interests are served. These political limits are particularly contingent on the management of diversity amongst stakeholders. Unless there is a process of managing consensus, industry demands for responsive training may lead to vocational education being skewed to the interests of particular groups of employers. A respondent expressed this point as follows:

There is general awareness from industries themselves that they can have some ownership of the training programs. This has given them the impetus to suggest changes to their industry organisations; i.e. to make recommendations for change. Their voices will be heard, but they may also feel that it's the big industry that tends to try to drive the curriculum, although in our trade areas it is not the big employers who are the major employers of apprentices. Large State instrumentalities and most other corporatised/user-pays organisations, use a lot of sub-contractors, rather than the same permanent workforce as they used to. They don't employ apprentices. It is the sub-contractors who employ most of the apprentices but they may feel that their needs for change are not listened to as well as big businesses.

There are *social limits* to flexibility because, as a teacher commented, individuals and agencies are still constrained by social beliefs, power plays within organisations and prejudices. This teacher reflected that, irrespective of training reforms or the achievements of students, some will still be treated unfairly:

We had a young Vietnamese student who worked very hard and was very good. I recommended him to an employer but he didn't get the job because someone else in his organisation stepped in and said no.

There are *content limits* to flexibility. Training for effective participation in an occupation requires only partial diversification by industry, region or enterprise. An apprentice will learn understandings and skills that have currency across sites. As a teacher points out, only some skills and capacities will be strictly site-specific:

The content I believe would be the same. Obviously if we are talking about brakes, the law of physics doesn't change, although you do need to keep yourself up with technology.

There are practical limits of fixed physical and human capital on change and flexibility. These are *limits of history*. They are limits that arise because of the way things have been done in the past. A teacher explains:

We have [training] *systems that the powers that be want implemented, but we have workshops that were set up for traditional face to face delivery pre-CBT. Then we introduced CBT with*

overnight implementation. We were almost always in catch-up mode for facilities. Now on to Training Packages and it's the same. Maybe they have been piloted in some areas, but we rarely get an opportunity to trial, to see what the problems are, to look for solutions and ways to overcome those problems.

There are also *limits associated with managing change*. In a context of very rapid change, there are dangers in over-specialising physical and human capital. This is because current projections of what is needed may not be the same as what is required in practice. Given the lead time necessary for building, there is value and economic good sense in some conservatism. As a teacher suggests, this point is generally recognised by industry.

We are looking at designing a new technology building to be ready in the latter part of the year 2000 but a lot can happen in the meantime. We may need a facility, which we can change to suit on a day-to-day basis. We need flexible physical facilities, but the availability of finances will put constraints on that. So we need flexible physical facilities and a way of developing appropriate learning resources. We hear of the virtual college. It's one thing having this high technology available but I'm not quite sure that this is what industry wants. We are out there now selling the new concept of user choice training for apprenticeships, but a large number of industries are still saying we want our trainees to go to TAFE.

The limits of managing change converge with *educational limits* on flexibility. This is, in part, a lead-time argument in relation to the preparation of individuals for occupations or the education of young children as adults. It takes 12 years to put a child through primary and secondary school. We do not know what particular challenges they will face so it is important to not reduce the stock of human capital that can be made available to deal with change in the future. As the teacher quoted below notes, industry is increasingly recognising the value of thinkers as well as doers, particularly as the demands for problem-solving, innovation, and knowledge-work increases:

I think that the industry is starting to see that it needs to have people who are skilled in a particular area (suspensions, exhausts, ignitions) … but there also appears to be a need for a rounded tradesperson, someone who can transfer what they learnt in this to this. Let me give you an example. I have been asked 'how do you know so much about engine management?' I don't but it is basic principles. We have this little black box now that does all these wonderful things but inside that little black box are littler black boxes which do certain things. If you know what the engine has to have then it is easy to relate what has got to happen inside the box. So it's not that I do know a lot about engine management but I go back to basic principles and consider those things. Now I believe that is what you call transfer, being able to take this information and apply it to this problem and I still think we need those people. There are people out there who are operating as motor mechanics but also operate with a fairly high level of competency, where they solve problems by thinking about it rather than doing it.

Finally, there are *teaching limits*. Part of the social capital of training is the human capital of vocational education teachers. But what is frequently neglected is that their special skills do not lie just in their vocational knowledge but in their skills and relationships as teachers. Teachers are specially skilled, through their training, character and experience, in relating to students, often across complicated cultural divides, in encouraging learning and in enhancing students' opportunities to learn to learn. It is these teaching skills that add significant value to students and determine their learning productivity.

Proponents of the holistic competence strategy argue the need for reformers to work through procedures that build the capacities of the human as well as building technical factors by means of instructional technologies. As a Queensland teacher commented:

We need to provide appropriate and timely professional development for our staff. Those people who are to carry out or support the training need to understand the new (training) systems so they won't fall in a heap. More than ever we need to be aware of the individual learning styles of our learners and to adapt to that as quickly as we possibly can.

Proponents of the flexibilisation strategy, on the one hand, seem to seek almost-infinite flexibility and to exclude teachers' concerns about undue flexibility by trying to teacher-proof teaching. The holistic competence strategy, on the other hand, acknowledges the substantial contribution teachers make to learning and seeks to integrate teachers and their pedagogical know-how into necessary vocational education reform.

Conclusion: The educational effects of CBT

The data we have analysed and discussed in this chapter make it clear that vocational educators have a knowing, insightful understanding of the nature of their work and how it has been affected by the implementation of CBT. They see benefits in the introduction of CBT but they also see educational difficulties. There are differences in teacher perceptions, to some extent, depending on the State in which they work and its particular traditions of vocational education, and the industry sector in which they work and its particular culture and traditions. To some extent, also, differences of perception of CBT and its effects are related to personal, organisational and industry sector variations, and the capacities of colleagues, organisations and industries to both respond to the changes and impose their own limits on change.

For example, in relation to industries, we have explained that preparing apprentices in the metals industry had long been, by the mid 1980s, one of the great success stories of TAFE. There was a strong relationship between institutes and industry bodies, large numbers of apprentices, largely agreed curriculum across the industry and providers, and a long tradition of engagement between teachers and industry practitioners. Metals training was well entrenched. Hospitality, however, was just beginning to expand by the mid 1980s as training reforms were being developed. There were fewer apprentices although some institutions had successfully developed programs and catered to the market. Moreover, the industry was diverse and had relatively low status, and curriculum was, some hospitality teachers claim, in something of a mess. But things changed rapidly from that point. Although training reform in the metals industry drove training reform in general during the late 1980s and into the 1990s, metals began to lose its glamour status within training. One of its challengers was clearly hospitality, which shed its 'Cinderella' status as the tourist boom from the mid 1980s ensured increasing employment growth and demand for service training within the industry.

From the start of the introduction of CBT and other training reforms, therefore, changes were likely to be perceived differently within the ranks of providers of metals and hospitality training. Metals was the area in which the government, at the time of introducing the reforms, perceived the need to control the work of teachers, unpack and rebuild the apprentice system, and steer the reconstruction of the industry. Naturally enough, a number of metals teachers have felt imposed upon and that their contributions to their industry over many years has been devalued. Some regard changes as having been made simply for change's sake. To some extent, experienced teachers in the industry feel that the directions of education and training that they had been working hard to pursue have been closed off by the reforms. In these circumstances, CBT is quite likely to be associated with negative effects on training in the sector. Such is much less likely to be the case for teachers in hospitality. Hospitality training has been booming for the past decade and has expanded greatly. In the

expanding market for hospitality training, private providers have been able to secure a substantial slice of the action. Coherent training programs have been put to use. Training in hospitality is in much better shape than a decade and a half ago, but this probably has more to do with the expansion of the industry than with training reform. Nonetheless, because training reform is associated with the expansion, and with the excitement and satisfaction of generating new courses and modules for large cohorts of students, one would expect a somewhat different interpretation of the effects on teaching of CBT.

Rather similar points can be made about differences between the perceptions of TAFE providers and non-TAFE providers. The demographics of TAFE are such that the bulk of teachers still in the system came into it in the early 1980s at the latest. They would have been expected to have had at least five years experience in industry prior to undertaking teacher training to equip them for their positions. In the intervening 15 to 20 years they may or may not have kept up with developments in their industry—although the data from the teacher histories suggest that they did, and that they were very much engaged in responding in different ways to industry needs. Nonetheless, they *did* develop a strong culture of teaching, as the interviews and focus groups made clear.

The most notable element of the teacher culture, and the one that was emphasised in the full range of interviews and focus groups, is the conviction that teachers make a profound difference to students and their learning. Time and again respondents were adamant on the point that, in industrial language, teachers 'add value' to students in ways that extend beyond merely equipping them with the skills specified in course curricula. The most valuable learning they promote, they say, is related to developing persons who learn how to learn. This capacity is principally influenced by the quality of the teacher-student relationship.

Within this teacher culture, among other things including a sense of professional dispositions, norms and values, teachers by and large regarded their clientele as students and industry and, to some extent, government. Of these, our informants overwhelmingly saw the principal client as the *student*. But the relationship they described prior to CBT was not client-oriented so much as oriented towards a kind of engagement with 'clients' (or simply other participants in vocational education) that would enable the incorporation, if the teachers and their institutes so decided, of 'client' needs into the operation of vocational education. Such a participative arrangement was perceived by training reformers, as we have discussed, as being too reliant on the perspective of educators when what was really needed was the direct responsiveness of training providers to what industry required. Vocational education and training, it was argued, needed to be industry-driven if Australia was to be economically competitive. The particular shift in emphasis that was believed necessary in vocational education and training, therefore, was for the educators to be responsive, first and foremost, to the training needs of industry rather than to the educational needs of students. This is the explicit shift in the policy framework associated with CBT that teachers in our sample are most concerned about.

Private providers might have been expected to have less of a developed teacher culture. Certainly, in our sample, although small, we noted a view among private providers that the principal client as far as metals instruction was concerned was *industry*. For private providers of hospitality, the principal client was sometimes regarded as industry and sometimes as fee-paying students. But the strength of the view that industry was the principal client to be served was nowhere near as great as we had anticipated. However, in making this point we need to make clear that our data from private provider teachers are limited. To be sure, a number of teachers in the private sector had been employed straight from industry and could be said to have

been free of the hang-ups of teachers who had experienced long careers in the bureaucratic TAFE system with all its traditions and entrenched culture. But teachers in the private sector did not provide views that were generally remarkably different from those of their colleagues in TAFE. The reason for this may be associated with the fact that some of the most articulate private providers had come to their current positions from experience in TAFE. Nonetheless, although this group of informants saw the impact of CBT somewhat differently from TAFE teachers in terms of opportunities for the expansion of training, there was surprisingly little difference in substantive views of the effects of CBT on the role of teachers.

Perhaps the strongest area of agreement across the full range of participants was in relation to the perceived contradiction between the effect of CBT on encouraging flexibility while simultaneously encouraging standardisation in training. There was a general perception that while flexibility was welcomed there were limits to its usefulness. Further, there was general agreement that flexibility in vocational education and training curriculum, assessment and delivery *should* be limited. That teachers recognise, understand, and are able to implement practical limits upon rampant flexibility is an important finding of this project. There were warnings from teachers about the perceived trajectory towards a Taylorisation of teaching based upon the separation of conception and execution in the teaching labour process. Such concerns were articulated by a number of our respondents and have been noted by many commentators on training reform.

Reasons behind the introduction of Taylorism in industry settings are typically associated with issues of control of the workforce. There seems little doubt from the nature of government motives outlined in official reports and policy documents that the purpose of reform of vocational education and training, commenced by the Commonwealth government in the mid 1980s and continuing apace throughout the past 15 years, was largely to control teachers. Such control was necessary, it has been argued for the past decade or so, in order to ensure that reforms, which were intended to make training more responsive to industry and to produce a highly-skilled and productive workforce, were implemented. Such attempts at control are commonly accompanied by a radical flexibilisation of teaching labour (Angus 1998). Teachers are plugged in to instruct, irrespective of the curriculum content they bear as vocational educators who can induct students not only into the skills they need for discrete jobs, but also in the cultural process of thinking and being a member of an occupation. The Taylorism of teaching is increased when it is presumed that instructors can be brought in, possibly with little pedagogical training, to deliver courses but with no other obligations to the students or the occupation.

It is a reality of the current training system that, increasingly, sessional teachers are being used to deliver programs. This practice is justified on the grounds that sessionals have up-to-date industry experience. But what this strategy fails to recognise, as is implied in the responses of our sample of teachers, is that teaching is an occupation with its own skill base, which is rooted in capacities to induct students into expansive learning and to enable them to learn how to learn. To the extent that our data and interpretations are correct, relying on a flexible workforce of sessional teachers is an extremely short-sighted strategy that neglects the invisible human capital associated with the tasks of teaching and encouraging learning. However, as we argued above, staffing flexibility is only one of the ways in which teachers associate a push to flexibility in vocational education with CBT.

The flexibilisation strategy potentially has no limits. This is a concern for teachers we interviewed. Curriculum and assessment can change. Teaching can change. Teachers can be changed, either by driving reforms in teaching work or by replacing

recalcitrant teachers by more flexible and compliant labour. This approach places a great deal of weight on abstracted economic models of rational actors and market mechanisms to justify the total re-engineering of vocational education. Fixed capital, capacities and cultures are regarded as limitations to be overcome by ratcheting up productivity, redefining outcomes in accounting terms and driving providers to retool their instructional technologies. Our informants have generally rejected the appropriateness of such unconstrained flexibility, and its association with Taylorism, in vocational education.

'Holistic competence' is the term we have used in this chapter to describe an alternative approach to that of Taylorism of teaching and a drive towards rampant flexibility. Holistic competence, we have argued, is demonstrated by teachers who recognise the contradiction between standardisation and diversification and attempt to manage it in holistic ways. Such teachers in our study, we suggest, recognise the broad character of the vocational expertise into which students are being inducted and use their established professional expertise as a means of grounding their practice in something that is stable and which resists work intensification. They assert the vocational and pedagogical role of the teacher in enhancing student learning.

The movement towards holistic competence is recognised by other vocational educators, including private providers (e.g. Sefton et al. 1995). But the capacity to tailor CBT to students, while also accommodating diverse enterprise requirements, makes sophisticated demands on teachers' teaching capacities. As Sefton and her colleagues (1995) have argued, teachers' professional competence in managing the integration of curriculum, pedagogical and assessment skills, alongside their communication and discursive capacities, must be recognised as a significant means of enhancing learning.

The holistic competence strategy recognises that there are limits to flexibility. These may be greater in TAFE than in smaller private providers but, even here, according to our data, limits are eventually reached. This is because limits to corporate organisation and efficiency are grounded institutionally and lived on a day-to-day basis in individuals' and groups' normative practices and commitments. This view recognises the significance of social capital in human affairs. It acknowledges that abstracted economic models of the rational actor and the market are inadequate representations of real live individuals and their social action. Fixed capital may be re-engineered but capacities and cultures that are grounded in the social capital of human relationships and communities are both more difficult to change and more unpredictable in their responses. Increasing the productivity of learning, refocussing on fine-tuning outcomes and encouraging teachers to change, are all necessary and proper activities for educators to engage in as vocational education moves to meet the challenges of informational capitalism. But when such changes are informed by economic modelling rather than consideration of the responses of people, there is a significant probability of distortion, deviation and damage. Recent experience in South East Asia, Russia and Latin America illustrates this point.

In terms of flexibility, the data displayed throughout the previous three chapters are indicative of a tradition of teacher responsiveness to industry and economic needs over the past several decades. Such flexibility clearly existed in relation to curriculum (chapter 4) and assessment (chapter 5), as well as in relation to occupational and social changes, long before the introduction of CBT. With the implementation of recent training reform, and of CBT in particular, however, teachers seem to have felt that the educational agenda and the framework for education decision-making had been wrested completely from them. Teacher professionalism seemed to be of little consequence in the age of industry-led reforms. Indeed, any notion of teacher culture

seemed to be associated with what the reforms were moving away *from*. Hence, whereas in the past responsiveness and change within vocational education occurred within the tacit framework of teacher culture and professional norms and values, training reforms that have occurred during the CBT decade seem to have been asserted and implemented with little if any reference to educators in the sector at all.

So, from the perspective of most of the teachers we spoke with, and even industry representatives, teachers have had to adapt to the changes associated with CBT largely from a position of professional exclusion. Our data indicate that the effect of CBT on the role of teachers and on their work and labour processes has been profound. Much of their tentativeness in engaging positively with CBT, therefore, may be explained by the time it has taken for teachers to begin to integrate their professional concerns into the reform agenda by means of the strategy of asserting holistic competence. In this way it may be possible for instructors to continue to make judgements about the implementation of CBT from within the context of their educational professionalism. Some teachers in both TAFE and private provision have clearly been able to make this transition. For them, engaging with the new is now merely continuing the tradition of teacher professional engagement with the worlds of their vocational sectors, but such engagement is grounded within a core of teacher professionalism which requires them to come to issues of CBT from the perspective of educators.

Within training institutions as *educational* environments, then, there needs to be a strong awareness of the connections that are necessary *in an educational sense* between the institution, teachers, students, industries and enterprises, employment pathways, knowledge and skills acquired in workplaces and elsewhere, and opportunities for individual and vocational capacity building. We suggest that capacity-building strategies are developed in educational contexts that acknowledge the distinctive character of educational work while also recognising that such work is multi-faceted and intimately connected with industry needs and developments. Vocational education is not a simple process of transmitting information or skills but a complex process that develops individuals' and, indeed, an occupation's capacities to act in various environments. Vocational education should teach people how to be members of social as well as industry environments. Teachers, we would conclude, must both directly and indirectly have a stake in the ongoing development of CBT, rather than simply reacting to CBT as it is imposed on them, if the best educational outcomes of the CBT policy are to be realised. In an important sense, while CBT undoubtedly has had and will continue to have effects on teachers, teachers must also have effects on CBT.

7 Findings, conclusions and recommendations

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This research project has used a consolidated body of data from subjects across two States in two industries in both metropolitan and non-metropolitan centres to determine if, and in what ways, CBT has contributed to developing an adaptable and flexible workforce. Three separate lines of inquiry have been pursued in this project. These relate to:

- CBT as a model of curriculum development
- assessment practice
- the impact of CBT on instructors' practice

These three separate but interrelated lines of inquiry used the same body of data for analyses and deductions. However, the use of particular items across the sub-projects tended to differ. Moreover, the use of distinct but related means of analysis in the three sub-projects adds considerable value to the findings by providing three different evaluative 'cuts' into the impact of CBT. The different foci for analysis of CBT provide quite different viewpoints from which findings can be appraised.

The sociocultural and cognitive approach used in the curriculum sub-project uses the strands of constructivist theory to examine curriculum as something that is experienced, that informs individuals' actions and which therefore has particular consequences as a result of the kinds of activities and guidance that are provided. The assessment sub-project uses cognitive theory to examine the cognitive impact of CBT in the development of flexible and adaptable individuals, and to assess propositions about the ability of the competency-based approach to assessment to determine and reliably authorise, through public certification, the development of expertise. The sub-project on teachers' roles uses a sociological framework and focusses on changing institutional arrangements to understand patterns of change and continuity in teachers' roles as a consequence of the introduction of CBT. The framework is further used to delineate levels of impact on teachers' instructional practices, their broader work of vocational education, and how teachers' roles have been transformed under CBT. Collectively, these perspectives enrich not only the individual sub-projects but also the deductions made across the projects.

This kind of analysis is important for informing future VET policy and practice because the different analytical viewpoints provide a diversity of assessments that properly assess the multiple dimensions of reform through the CBT decade. It also situates these different assessments in relation to the circumstances associated with the introduction of CBT, and the circumstances that VET is likely to be called upon to address in the near future. Fundamental to this analysis, therefore, is a contemporary evaluation of the utility of CBT in addressing, firstly, the knowledge required in Australian workplaces at the commencement of the next century; secondly, its ability to address the needs of industry goals for a skilled workforce; and finally, its ability to satisfy enterprise requirements for skilful and adaptable employees. There is also a future-oriented assessment about the kinds of arrangements for curriculum,

assessment and instruction which will build on the strengths of the CBT decade in a way which furthers the overall goal of developing flexibility and adaptability.

The findings from each of these separate inquires are presented in chapters 4, 5 and 6, respectively. This chapter seeks to consolidate the outcomes of these three lines of inquiry in responding to the overall research question. The chapter commences with summary statements and overviews of findings from each of the three projects and then aggregates these deductions in providing a response to the central question. Following this, a set of proposals arising from the analyses and deductions are presented, suggesting means to enhance the prospects for achieving an adaptable and skilful workforce in ways that address the needs of industry, enterprise and individual Australians.

The next three sections summarise the responses from each sub-project to their research question.

Curriculum development and practice sub-project

The data relating to this sub-project are presented, analysed and discussed fully in chapter 4. A series of deductions was advanced from this analysis. This section responds to the question set for the sub-project by drawing upon the analyses and deductions in chapter 4. The question for this sub-project was:

> *In what ways has the CBT model of curriculum been able to address the needs of industry and enterprises and the aspirations and needs of Australians in VET?*

The responses from each of the three client groups (industry, enterprises and individuals) are discussed below. Summary statements, followed by a more detailed discussion about the ways in which CBT meets, or has failed to be meet, their needs precede the conclusions drawn.

Industry needs and the CBT model of curriculum

CBT meeting needs of industry: Summary statements

- Changes were made to the curriculum development processes to directly respond to industry needs.
- Outcomes of the curriculum development process were changed from an 'internal' VET focus to one focussing upon industry/enterprise needs.
- The role of industry in the determination of intents and content—the intended curriculum—was given precedence over the role of teachers.
- There has been an institutionalisation of industry/enterprise involvement in the curriculum development processes (ITABs).
- Measures have been implemented to secure teachers' industry currency (Accreditation).
- There is evidence that current VET provisions are securing adaptable industry outcomes.

How the CBT model of curriculum has met industry needs: Detailed statements

The CBT model of curriculum secured some adherence to industry mandated procedures; in particular, the centrality of the industry voice in determining course content and intents (aims, goals and objectives), more uniform assessment practices and accreditation procedures provided the means for externally derived demands to be implemented.

Curriculum processes have become more responsive to industry needs, albeit at the cost of teacher autonomy. This responsiveness has been manifested through accreditation and registration processes. These processes have closely aligned curriculum intents, content and some teacher activities to industry needs. This is evident in the reduction of the role of teachers in the development of curriculum intents and content, and measures aimed to maintain teachers' currency.

The introduction of CBT brought with it a nationally uniform means of developing and organising curriculum documentation within VET. For example, prior to its implementation, different bases for curriculum decision-making and organisation were being used in both sectors. In both Victoria and Queensland, the provision of curriculum documentation and associated procedures for the metals industry was centralised within the training system. However, in hospitality, college-based curriculum provisions guided curriculum practice much more. For both industries there was a change to processes centralised outside of the training system under the auspices of national and State industry advice.

There is evidence that the development of the robust knowledge required for transfer within an industry sector has been secured largely through the existing curriculum provisions. The strongest evidence is found in the consequences of instructional activities (group learning, self-directed learning, teacher-guided instruction) and unintended processes (part-time work in enterprises) and factors providing a basis for students to engage in problem-solving activities (project work). These are reported as being the kinds of experiences likely to secure the forms of knowledge that underpin adaptability, flexibility and transfer. The important finding here is that the kinds of experiences the students are engaging in seem likely to be a useful source of higher order outcomes of the kinds required for adaptability and flexibility. However, the question remaining to be addressed further is the degree to which these outcomes are the direct product of CBT or the product of other associated processes.

An outcome of industry involvement in the last decade has been to institutionalise the inclusion of industry as a source of needs in the curriculum development process. The introduction by ANTA of Training Packages has retained industry's involvement in the development and maintenance of competency standards through the continued involvement of ITABs through the National Training Framework Committee (NTFC). However, the formation of the NTFC brings the accreditation of competency standards directly under the control of ANTA, yet maintains industry influence over the curriculum, particularly the intended curriculum. Training Packages comprise both endorsed and non-endorsed components. Endorsed components are the national competency standards and assessment guidelines as endorsed by the NTFC. Curriculum documents, such as syllabuses are non-endorsed components and are not required to be endorsed by the NTFC. In essence, the role of training providers has been transformed from certifying the competency of students against learning outcomes stated in curriculum to certifying the ability of students to satisfy national competency standards using assessment guidelines which have been endorsed by the NTFC.

The question remains of how many providers are likely to continue to use curriculum documents as a basis for instruction. Also, it seems likely that the needs of individual enterprises will likely ultimately usurp national industry prescriptions (Billett & Hayes 1998).

CBT not meeting needs of industry: Summary statements

- Uniformity has not been achieved through the CBT model of curriculum, nor is it likely to be achieved.

- A reliance on curriculum use and accreditation processes to secure responsiveness appears to be flawed, as such processes have failed to secure the commitment of teachers.
- The use of uniform industry standards appears to not always reflect the needs of enterprises.
- The use of specific behavioural objectives and detailed standards in curriculum is not securing adaptability and flexibility amongst learners.
- Instructional processes, activities and means of engaging students, rather than specified outcomes and industry standards, have been identified as the means for developing robust industry knowledge.

How the CBT model of curriculum development has failed to meet industry needs: Detailed statements

The evidence suggests that teachers' use of syllabuses cannot be relied upon to deliver uniform outcomes because teachers' interpretation and utilisation of syllabuses are not the same. Importantly, much effort was expended in the development of uniform national syllabuses across the VET sector to manage a standard implementation process. However, it was only in those areas that teachers felt the pressure of accountability that there was much evidence of change. Perhaps the most commonly reported change was in assessment practices where work demands and push for uniformity was most widely apparent. As stated in the previous section, the impact of Training Packages on the use of syllabuses, and of ANTA's intention to create uniform national competency standards which can be customised to the needs of individual enterprises, is yet to be determined.

The prospect of achieving uniformity in response to industry needs was always likely to be unrealistic. There are different requirements of what comprises competency in different workplaces, different interpretations against standards, different levels of readiness of teachers and quite different circumstances for the implementation of curriculum, and judgements about competency.

Moreover, if some of the uniformity stated in industry standards were to be achieved, more than reliance on teachers' adherence to curriculum documents would have been required. Moderation of assessment processes and outcomes, negotiation with and involvement of those whose role it was to enact the curriculum—teachers—would also have been required.

Evidence of transfer across workplaces, in adapting to innovations and transferring basic skills across settings, is provided as evidence of the efficacy of the current curriculum arrangements. The first of these transfer outcomes is reported only in the hospitality industry. Also, it is hospitality industry/enterprise respondents who refer to transferring basic skills across the workplace. This may well be a part of employment of this industry more than any other factor. It is claimed that because work performance is contextualised, simple propositions about transfer need to be considered cautiously. However, as discussed above it seems that the securing of flexibility, adaptability and transfer has little to do with the central tenets of CBT, the specification of learning outcomes or the use of instruction and assessment processes that are focussed on these outcomes. Rather it is processes of instruction, engagement in activities and experiences found in the experienced curriculum that are most likely to secure these outcomes.

CBT meeting needs of enterprise: Summary statements

- Interactions between enterprises and providers help to develop an understanding of enterprise needs.

- Providers are responding to external mandating (e.g. teachers' currency, improved access, work-based learning).
- Customisation to enterprise need is becoming evident across providers.
- Instructional activities in classrooms and workplaces (e.g. project work, group activities, teacher-guided activities and self-managed activities) are seen as critical in the development of skilfulness and adaptability.
- Student competence is now increasingly being seen as relevant to the workplace.

How the CBT model of curriculum development has met enterprise needs: Detailed statements

Enterprise respondents claimed that multiskilling, student competence and relevance of courses had all been enhanced by CBT. Access to additional trainees and reduced time in colleges and in courses were also reported.

Closer interaction with enterprises has led to outcomes appreciated by all client groups (industry, enterprises and students). However, this outcome is not wholly a product of CBT.

Customisation of curriculum to enterprise needs is now emerging as a key goal for vocational education provisions and is also a key feature of the implementation of Training Packages. However, although CBT has pressed for a consideration of external sources in the determination of intents, much of the emphasis on enterprises has arisen out of the shift to an enterprise focus and the implementation of market-based policies which have caused providers to take account of enterprise needs.

Meeting enterprise needs has been through responsiveness to external mandations. Outcomes have included improvements to teachers' currency, understanding the requirements of enterprises through improved access to VET provisions, and work-based components of vocational education programs. These outcomes are largely the product of curriculum processes that have an external focus and of attempts by government to secure compliance through the use of accreditation procedures.

In terms of securing the skilfulness and adaptability (and particularly the multi-skilling) desired by enterprises, the analyses suggest that it is the kinds of activities that learners engage in, both in the workplace and in the classroom, which are likely to deliver these outcomes. Interestingly, this finding supports the sorts of arrangements that have traditionally been found in the apprenticeship system. Consistently, it has been reported that a combination of experiences (e.g. project work, group activities, teacher-guided activities and self-managed activities) is best for securing the knowledge required for adaptability and skilfulness. However, it may well be the combination of the experiences that is at the core of the utility of these arrangements. Hence, the quality of the enacted curriculum, something managed best by teachers, is likely to be central to the quality of learning and the prospect of securing the outcomes desired by industry, enterprise and individuals.

The focus of curriculum process on relevance, in terms of particular enterprise needs, is proposed as being central to views on the effectiveness of CBT in realising competitiveness. It seems that market-based provisions have been useful in enhancing competitiveness. Also evidence of the efficacy of these arrangements can be found in enterprises continuing to employ apprentices and send them to the providers.

CBT not meeting needs of enterprises: Summary statements

- CBT has not itself provided an approach to instruction that can deliver skilfulness and adaptability in the form of multi-skilling.

- Instructional activities in classroom and workplace (e.g. project work, group activities, teacher-guided activities and self-managed activities) are seen as critical in the development of skilfulness and adaptability.
- The need for a greater consideration of learning experiences that deliver competitiveness and multi-skilling is emerging as a issue.
- With the exception of sourcing the intents and content of the curriculum externally, CBT itself has not delivered the majority of enterprise needs.
- There is little evidence that CBT itself has improved competitiveness.

How the CBT model of curriculum development has failed to meet enterprise needs: Detailed statements

It is claimed that little or no evidence exists to link CBT with improved enterprise competitiveness. More specifically, because enterprise needs are so different there is little prospect of CBT being able to meet those needs whilst certification is premised upon centrally mandated curriculum documents. Instead, initiatives that have accompanied CBT, or were in place prior to its introduction, rather than CBT itself, have brought about the outcome of meeting enterprise needs through closer associations and greater interactions between enterprises and providers of VET.

While meeting enterprise needs (content and objectives) has become a feature of curriculum practice, more than this is required. A greater consideration of the instructional processes and experiences is required in order to develop the knowledge needed for skilful performance in these workplaces.

A combination of experiences in the classroom and workplace (e.g. project work, group activities, teacher-guided activities and self-managed activities) can best secure the knowledge required for adaptability and skilfulness. However, again, it may well be the combination of experiences that is at the core of the utility of these arrangements. For instance, not all learners were able to manage the demands provided by self-managed activities. Also, concerns about the inadequacy of teacher support were reported in both the quantitative and qualitative data. Hence, the quality of the enacted curriculum, something managed best by teachers, is likely to be central to the quality of learning and the prospect of securing the outcomes desired by industry, enterprise and individuals.

Many of these arrangements were in place prior to CBT and the shift to self-pacing can be associated with the broader CBT movement. Therefore, there is little here that suggests that CBT itself contributes to adaptability and transfer within enterprises, except in the provision and assessment of routine experiences and outcomes. While these are important and necessary for performance, on their own they are not adequate.

Individual needs and the CBT model of curriculum

CBT meeting needs of individuals: Summary statements

- The currency of teachers' knowledge is seen as crucial.
- The relevance of courses and outcomes is important if students are to develop transferable knowledge.
- An ability to transfer basic knowledge from the classroom to the workplace is necessary and needs to be developed.
- Some learners favour opportunities for individualised learning.
- Interactions between providers and enterprises help develop relevance.
- Certification that has national standing is valued.

How the CBT model of curriculum development has met individuals' needs: Detailed statements

The currency of teachers' knowledge is proposed as being important for providing students with content knowledge that is transferable to the workplace. In particular, in the hospitality sector where the courses are more college-based, the currency of teachers' knowledge is particularly valued. Unlike the students in metals courses, who spend the majority of time in the workplace, hospitality students are more dependent on their teachers' expertise because their courses are college based. Accreditation arrangements that demand currency of teachers' knowledge were reported as pressing some teachers into enhancing their skills and being useful in meeting students' needs. This outcome appears to be a product of shifting curriculum decision-making from an internal to a more external focus of concern.

Opportunities for individualised learning were provided through the use of self-paced approaches to instruction. This was seen as positive by those who were capable of adapting to this approach.

Students claim that the ability to apply basic skills and principles across different workplaces (e.g. the transferability of skills) is important. Hospitality students, in particular, supported this notion. Students saw the ability to transfer knowledge from the classroom to the workplace, as well as the ability to build on what they had previously learnt, as important. In consideration of process, students claim that transfer is underpinned by understanding and that understanding is secured through engagement in vocational education programs. Students also claimed that workplace learning experiences assist in the transfer of knowledge.

CBT not meeting needs of individuals: Summary statements

- The lack of relevance in course content to workplace activities is a key concern for some learners.
- Some learners believe that resource-based learning and self-pacing inhibits learning, particularly when teacher support is lacking.
- Dissatisfaction with the quality of the teaching/learning experience was a common complaint.
- There is limited evidence that CBT has resulted in skilfulness.

How the CBT model of curriculum development has failed to meet individual needs: Detailed statements

Not all learners reported being able to manage the demands of self-managed activities. Concerns about the inadequacy of teacher support were reported in both the quantitative and qualitative data. Hence, the quality of the enacted curriculum, which we assert is something managed best by teachers, is likely to be central to the quality of learning and the prospect of securing outcomes desired by industry, enterprise and individuals.

There were repeated claims, although not specified, that content of courses was not relevant to workplace activities. This was more prevalent in the metals than hospitality sectors. This requirement could be a product of the differences in the courses with the former being more work-based and the latter more college based.

The quality of instructional experiences, particularly access to teachers, was claimed to be indicative of how CBT had failed to meet individuals' needs. The use of self-paced resources to achieve flexibility in delivery was often at the expense of access to teachers.

There is limited evidence that CBT itself has helped achieve more skilfulness in students. Instead, the kinds of experiences that seem to have secured these goals were associated with activities that were intended as part of the broader CBT movement (self-paced and resource-based activities) and activities that existed as teaching practice prior to CBT (teacher-guided activities).

Conclusions

It seems that the current provisions of VET are meeting the needs of industry, enterprises and individuals in different ways. The mechanisms that have been used to source the intents and content for courses outside of VET are claimed to be meeting the needs of enterprises and industry. Also, the accreditation and registration processes are reported to be influencing curriculum practice in ways that are meeting these needs, and also those of individuals. These effects are held to be closely aligned to the CBT model of curriculum.

This model focusses mainly on the intended curriculum—what *should* happen—and in some ways the enacted curriculum. However, what is intended is not always implemented with fidelity because of differences in interpretations, circumstances and perspectives. Importantly, it is beyond the intended curriculum, which is the focus of CBT, that the likelihood of meeting the shared goals of skilfulness and adaptability occurs. Consistently, it seems to be the quality of educational encounters that determine whether these goals are realised. In combination, it seems that group-activities, individualised learning, resource-based activities, project work and teacher-guided experiences, as well as combinations of classroom and workplace-based experiences, are likely to deliver outcomes associated with adaptability and flexibility.

For industry, these goals are important for the development of robust industry-based knowledge that is transferable across workplaces. For enterprises, these outcomes are important for the completion of both routine and novel tasks. That is, the ability to be multi-skilled and yet also responsive to new challenges in the workplace is essential. For individuals, having knowledge that is adaptable offers them the prospect of realising their personal and vocational goals rather than being wedded to one employer.

Therefore, much of what has been the desired goal of government policy can be found in the processes that are used in determining educational intent and content—the intended curriculum. However, the processes of enacting the curriculum in the form of experiences and encounters from which learners develop the knowledge required for vocational performance are less directly influenced by CBT. It is concerns with process considerations, such as the quality of these instructional activities and learning opportunities, more than measurable outcomes, which have furnished the experienced curriculum from which learners have derived their ability to be adaptable and skilful.

Assessment practices sub-project

In chapter 5, the results relating to this sub-project are presented, analysed and discussed fully in response to the following question:

> *How have competency-based assessment practices been able to furnish information about individuals' achievements against benchmarks, thereby permitting judgements about student performance, credit and prior knowledge?*

The sub-project addresses the question by taking skilfulness or expertise as the benchmark against which the results pertaining to student assessment are appraised. Skilfulness is accepted in its broadest meaning, which includes the development of capacities (conceptual, procedural and dispositional) required to engage in a vocation.

Flexibility and transferability are desirable in individuals wishing to pursue personal and career goals, as they are to the industry itself. Advances in cognitive learning theory and the nature of expertise have also contributed to a greater understanding of the development of expertise. As a result, it is clear that vocational education needs to prepare workers who are 'able to generate and evaluate skilled performance as technical tasks become complex and as situations and processes change, reason and solve technical problems, be strategic, innovate and adapt' (Stevenson 1994, p.9). In the appraisal of the results of this project, it is argued that the more uniform assessment practices are, in many ways the more detrimental they are to the very goals of the national reform agenda that the implementation of CBT was supposed to fulfil.

Summary statements and discussion from chapter 5 are presented below, including the conclusions drawn.

Summary statements

Discussion in chapter 5 was concerned with the following key issues:

- *Incentive*—Non-graded passes are seen as demotivating by many students (and especially better students), teachers and employers, whereas what is required to develop expertise are high incentives to commit to learning.
- *Practice and understanding*—There has been a de-emphasis on theory and a re-emphasis on practice in assessment. This has increased opportunities for the development of routine skills but limited opportunities to reapply and extend those skills in combination with theoretical concepts. Less tangible aspects of assessment such as attitudes and 'common sense' also tend to be neglected.
- *Authenticity*—The focus of assessment is on demonstrated competence in action and is more closely linked to 'real life' situations of work and more focussed on specific workforce needs.
- *Complexity*—There is little evidence in the data of assessment of problem-solving and creative abilities. Clearly this is of concern for workplaces which are under more or less constant change and where new products, new practices and new technology are being introduced at an increasing rate.
- *Integration*—The partitioning and assessment of learning into small modules is unlikely to bring about integration of knowledge that is required for expertise. More holistic, global and integrating assessment that accumulates within and across modules is called for.

Expert workplace performance involves deep conceptual understanding, well developed routine procedures and the ability to be flexible, creative and adaptable in the face of new endeavours, problems and change. It is argued that at least six factors are of critical importance in assessing expertise. These are having learners who are motivated, who have well developed routine skills, who have a deep understanding of what they are doing, who are capable of engagement in a variety of tasks in complex authentic settings, and who can integrate their knowledge and skills to achieve adaptability. Each of the six factors is examined in turn (except that 'Practice' and 'Understanding' are taken together) in order to appraise assessment practices under CBT.

Incentive

The assessment issue that provoked the strongest response from students, teachers and industry representatives was that of the non-graded pass. The issue is coupled with motivation for learning and performance. Learning, especially for complex abilities involved in expertise, occurs more easily when learners are motivated. Of course, motivation is not always linked to grades. Nevertheless, assessment and reporting processes that provide incentives are powerful in promoting the development of expertise.

For the most part, teachers and employers were adamant that non-graded assessment was demotivating, especially for good students. Students also reported that non-grading was an issue, but were more evenly divided between its benefits and problems. On the question of future directions, a return to the graded system that encourages and rewards excellence was widely advocated. Other improvements suggested were that students be ranked according to how easily and quickly they achieved the competency. Thus, non-graded passes are seen as demotivating by many students (and especially better students), teachers and employers, whereas what is required for expertise are high incentives to commit to learning complex material.

Practice and understanding

In the context of this study the knowledge of understanding is commonly referred to as theory or conceptual knowledge and the knowledge of skills as practice. Since both are spoken of together (often as contrasts) they are discussed together. Routine procedures, demonstrated as practised skills, are required for expertise. They are acquired and developed towards automation through repeated application. Expertise, however, also relies on understanding. Knowledge of situations and of linkages between components provide the understanding of when and where practised skills should be used and when known skills are inadequate for the job at hand.

With the emphasis on more easily specified technical requirements, less tangible aspects of assessment such as attitudes and 'common sense' get neglected. There has been a narrowing of learning, which to a certain degree has become disaggregated:

> *There's been a strong switch from 'education' to 'training' and a very strong focus on the workplace. The continuum of training hasn't been addressed—we tend to atomise training under CBT.*

Expertise with adaptability requires deep understanding and rich connections between theory and practice. In suggesting future directions for the development and assessment of expertise, less assessment and less paperwork would be a step in the right direction. While this would lower the level of detail in auditing and accountability, it would allow a broadening and deepening of assessment tasks and permit a re-emphasis on theory and its contribution to performance. It is doubtful whether the implementation of Training Packages will be able to meet this requirement.

Authenticity

A powerful idea underlying vocational training is that learning can be transferred from the setting in which it is learned to that in which it is needed to perform work. The ability to successfully perform in a variety of ways and settings, especially rich variable settings such as many authentic workplaces, provides evidence that an individual is adaptable. This ability can therefore be used as a basis for assessing expert performance.

As a result of the implementation of CBT, competency-based assessment is more aligned with industry standards and more closely linked to 'real life' situations of work. While workplace assessment is common, simulations and role plays (e.g. in a training restaurant) also provide an opportunity for learners to practise in a safe environment. Yet there is a cautionary note; the increase in standardisation of assessment works against the opportunities for trainees to be able to demonstrate their capacity to function under a variety of circumstances. As to the future, it is claimed that on-site delivery would improve assessment practices. Testing of specific tasks should be extended as part of a real job as it would occur in the workplace. Assessment is needed that is related as closely as possible to a task in the workplace so trainees can appreciate that a task is done for a real purpose and at a standard that

industry demands and expects. Greater authenticity and variety of assessment settings provide opportunities to demonstrate (and develop) adaptability.

Complexity

The results provide direct evidence of the need for complex intellectual abilities such as those involved in fault diagnosis, creative design and problem-solving. For example, in hospitality the style of cuisine changes on a very regular cycle so people who have the skills to do both the old and the new and draw from the old to create tomorrow's new are needed to help a business grow.

The results provide evidence that such abilities are being developed and assessed in select areas. Yet the paucity of references in the data to the assessment of problem-solving and creativity suggests that most trainers and students are not aware of the importance of such abilities and that assessment is not geared to examine them. Clearly this is of concern for workplaces which are under more or less constant change and where new products, new practices and new technology are being introduced at an increasing rate.

Integration

The ability to integrate knowledge and skills from various sources is of importance for adaptability and expertise; assessment ought to test this ability. The results indicate that before CBT, the graded system of assessment was more holistic as it tested large chunks of work and encouraged integration and accumulation. This provided an encouragement for broad skilling and problem-solving. By contrast, under CBT, assessment, while more practical, has made it difficult for students to research their own topics and does not provide enough integration of theory. There is a need for a more holistic approach to produce competent students who can bring a variety of skills and knowledge together.

On the question of how assessment practices ought to be changed, the general findings are that assessment needs to assess multiple learning outcomes, be more global especially in the areas of supervision and interpersonal skills, and ensure that previously acquired knowledge is integrated with new work, for example through final exams or projects. Other solutions raised were to test later or over a period of time to monitor increase of performance rather than marking only once. Thus the partitioning and assessment of learning into small modules, as is now common under CBT, is unlikely to bring about the integration of knowledge that is required for expertise. More holistic, global and integrating assessment that accumulates within and across modules is called for. It would appear that Training Packages have the potential to allow for a more integrated approach to assessment; however, the realisation of this potential will depend on how this initiative is implemented and cannot yet be appraised.

Conclusions

Since assessment (and the results and credentials which arise from it) is a prime motivator of staff and student activity, its control is also a powerful manager of change. The CBT movement has placed great emphasis on changing assessment practices to make them more uniform nationally and to ensure that these practices conform more rigidly with perceived industry needs as defined in competency standards. Despite this move for conformity, chapters 4 and 6 of this report demonstrate that curriculum design and teachers' practices retain a degree of diversity. While practices differ, the issues that surround assessment under CBT show a greater degree of uniformity across industries and States than for curriculum development or teaching.

CBT brought pressures towards greater uniformity aligned with industry standards and a very substantial increase in testing, record keeping and auditing. Assessment became more workplace oriented but also more dominant and more focussed on once-off performance of disaggregated skills. Six indicators of expertise were used in appraising the evidence. Incentive for students to perform well is lowered under a non-graded system. Practice is enhanced by the added emphasis on performance. However, broadening and deepening of assessment tasks with a re-emphasis on understanding of theory and its contribution to performance is needed for the development of expertise. Assessment in authentic settings such as simulated or actual work as happens more frequently under CBT is positive in terms of expertise. However the lack of emphasis on complex tasks such as problem-solving and creativity and on the integration of knowledge and skills from differing sources is cause for concern. Thus, for assessing expertise, while there are encouraging signs in terms of authenticity and practice, there are also some serious questions about the capacity of assessment practices, as they are now commonly implemented, to provide for the kinds of flexibility and adaptability of the Australian workforce that will make it more globally competitive.

Teachers' practice sub-project

The data relating to this sub-project are presented, analysed and discussed in chapter 6. Also, a series of deductions are advanced from this analysis. The question posed for this sub-project was:

How has the implementation of CBT influenced the practice of instructors in VET?

In examining teachers' practice a number of key issues evolved from the data. These issues are presented below as a series of summary statements that are followed by a more detailed discussion drawn from chapter 6.

Changes to instruction

- Since 1989 there has been a lack of input of educators into curriculum and assessment design.
- CBT encourages the measurement of specific aspects of learning that can be seen, in some respects, as disconnected from teachers' relatively holistic conception of teaching.
- CBT is often perceived as something akin to an administrative technology; it is a framework for VET delivery in purely behavioural terms, which lead to inappropriate restrictions in teaching practice.

Teachers' role

- CBT is associated with the production of specific knowledge (in the form of facts and know-how) and specific behaviours. However, respondents strongly held that outcomes of teaching and learning ought to be viewed in terms of 'process outcomes'.
- Teachers felt that the most important aspect of teaching and learning ought to be the development in students of the capacity to learn how to learn throughout their careers and their lives. Promoting such capacity was seen as the work of teachers not instructors.
- Changes that have occurred in teachers' practice since 1989 are viewed by them in terms of degree, rather than kind.

Teaching methods

- Diversification of teaching methods has occurred since the introduction of CBT with a shift away from teacher-centred instruction.

- Shifts have occurred from college-based face-to-face teaching, guided by the curriculum, to methods that place an increased emphasis on assessment.
- There has been an increased responsiveness by teachers to industry and enterprise needs with an expansion of workplace delivery and assessment.
- An increased need for student support has been noticed by teachers.
- Less importance is placed on the need for teachers to use their professional judgement. This limits the range of teaching practices teachers use and the nature of their relationship with students.

Impact on students/trainees

- The introduction of CBT has restricted the relationship between teachers and students.
- Limited conceptions of the role of the teacher that are associated with CBT have resulted in different learning outcomes under CBT.
- Some teachers have noticed different and less personal social and educational formation of students.
- Too much emphasis on self-pacing and text-based materials has distanced students from their teachers.

Impact on teachers' work

- There is intense pressure on teachers to deal with change.
- An increase in sessional and contract employment has led to a decline in common understandings about good practice in teaching and standards of performance.
- Teachers feel that their special skills do not lie just in their vocational knowledge but in their skills and relationships as teachers.

Transformations in teachers' roles and identities

CBT, we conclude, has had a profound effect on the practice of instructors, but the effect in many cases has been indirect rather than direct. Moreover, one's assessment of the impact of CBT is dependent on how one sees the role of instructors. An important finding in this respect, in relation to the sample of TAFE and non-TAFE instructors who were interviewed for this project or who took part in focus groups, is that respondents tended to regard themselves as 'teachers' not 'instructors'. Such self-labelling is important to participants, they claimed, because the label 'instructor' implies a narrower role and range of professional duties than does the term 'teacher'. To them, the term instruction means face-to-face teaching and monitoring of students. Teaching is something that is much more complex and involves a wide sweep of activities that require the exercise of professional judgements and engagement with students, colleagues and stakeholders. Indeed, the distinction made between these two terms in many ways summarises the range of concerns that many participants, including some industry representatives and curriculum personnel, express about the impact of CBT on the role and practice of teachers.

Although generally supportive of the notion of competencies, and of greater engagement between providers of VET and industry, teachers in the main were concerned that the character of the CBT-based model of curriculum, assessment and pedagogy that characterises current VET instruction has been designed without the input of educators. In relation to assessment in particular, the prevailing view is that CBT encourages the measurement of specific aspects of learning which can be seen, in some respects, as disconnected from teachers' relatively holistic conception of teaching. From the broad perspective of educators, CBT is perceived to promote a focus on the learner as knower and doer in relation to a specified range of skills and knowledge, or competencies.

While important differences in perceptions about teachers and ways of teaching emerged in the data between individuals, Victoria and Queensland, metals and hospitality, TAFE and non-TAFE, there was strong consensus on certain aspects of the teacher's role. Most strongly asserted was the view that teaching is not just about the production of fixed outcomes, yet CBT was associated with the production of specific knowledge (in the form of facts and know-how) and specific behaviours. Respondents spoke instead about outcomes of teaching and learning in terms that could be described as 'process outcomes'. Usually, the most important aspect of teaching and learning that was emphasised was the part teachers should be playing in developing in students the capacity to learn how to learn throughout their careers and their lives. Promoting such capacity was seen as the work of teachers not instructors.

CBT as an administrative technology

The effect of CBT on instructors is also complicated because its implementation is clearly associated with funding cuts in TAFE and with intensive price competition across both public and private providers. For this reason CBT is often perceived as something akin to an administrative technology—a framework for VET delivery which restricts the full repertoire of teachers' work to the aspects that are most likely to promote tangible, measurable outcomes in terms of what students can demonstrate they can do in behavioural terms. Indeed, perhaps the strongest message to be drawn from the data generated across all three sub-projects is that teachers, and other commentators on VET, are sceptical about CBT's implied reduction in the role of the teacher, and of limitations on what might legitimately be regarded as appropriate teaching practice.

Reform of the teaching labour process

The teacher histories and focus groups confirm that the introduction of CBT resulted in both change and continuity in the instructor's role. It seems that teachers experienced the combination of continuity and change not as a revolution in vocational teaching but as specific changes in their practice. Their new practice, they say, differed in degree rather than kind from previous practice. This is not to say that there have not been direct effects on the patterns of teaching practice. Such effects include shifts from college-based, face-to-face teaching guided by the curriculum to an increased emphasis on assessment, diversification of teaching methods, an expansion of workplace delivery and assessment, increased responsiveness, a shift away from teacher-centred instruction, and an increased need for student support.

However, when teachers spoke about such specific changes and commented on the effects on their work and their occupation, they insisted that the specific changes add up to a profound revision of the character of their work. CBT has shifted certain work practices, such as assessment, in ways that have some clear continuities with prior vocational education assessment practices. Yet, what have also changed are the relationships between curriculum, assessment and teaching. This indicates that, as well as shifting teaching practices, CBT has contributed to shifts in the relationships and emphases between teaching and other aspects of teachers' work, and between teachers' relationships with students and other agencies, particularly industry. In other words, even though some teachers refer to a range of continuities in the detail of their day-to-day work, it is clear that the context in which they work has experienced profound change. The way in which their work is conceptualised, by them and others, has changed accordingly. The critical point is that the overt and easily-identifiable changes in teaching practices and relationships add up to a more comprehensive and intangible set of reforms in the teaching labour process.

The element of teachers' work prior to CBT that was emphasised by respondents was the notion of professional judgement. This notion was connected with a sense of teacher culture in which teaching practice is guided and enacted by the teacher's holistic sense of what needed to be done. In other words, teachers have a sense of professional responsibilities deriving from their occupation as both teachers and persons with commitments to metals or hospitality industries, and a repertoire of training experience. CBT, it seems, has had effects on limiting the range of teaching practices teachers use and the nature of their relationship with students. The key finding in this respect is that, although teaching practices have changed as a result of CBT, there have been more significant but less obvious changes in the relationship between instruction and other aspects of teachers' work.

Restriction of the relationship between teachers and students, and limited conceptions of the role of the teacher, are likely to result not only in different learning outcomes under CBT but also in a different and less personal social and educational formation of students. The CBT-based training process, as one put it, 'produces different kinds of people'. This point is important when related to the reduction of support for students within the VET system that was mentioned by a number of respondents. In particular, it was felt that too much emphasis on self-pacing and text-based materials distanced students from their teachers. Moreover, it was felt, competent performance could never be guaranteed and, in any case, the development of well-rounded tradespersons required contextualised learning and teacher engagement.

Reshaping teachers' labour

The intensification of teachers' work that has been brought about, according to respondents, as a result of funding cuts, competitive pressures and the need to generate income, has put pressure on teachers to deal with change. Shifts in employment conditions have also contributed to change. A substantial increase in sessional and contract employment has increased the range of people involved in teaching and assessment. Such diversity has necessitated reforms because common understandings about good practice in teaching and standards of performance that had previously been established in relatively small and stable groups of teachers could no longer be maintained. This issue of sessional and contract employment illustrates concerns teachers have about the flexibilising effects of CBT on their work.

Within CBT policy, sessional teachers are valued because they have up-to-date industry experience and introduce considerable staffing flexibility. But teachers regard teaching as an occupation with its own skill base, which is rooted in capacities to induct students into expansive learning and to enable them to learn how to learn. The point is that the social capital of training is the human capital of vocational education teachers, whose special skills do not lie just in their vocational knowledge but in their skills and relationships as teachers. Teachers are distinctively skilled, through their training, experience, and professional norms and culture, in relating to students. They encourage learning and enhance students' opportunities to learn how to learn. Such skills add significant value to learning experiences of students and determine their learning productivity.

Vocational education is not a simple process of transmitting information or skills but a complex process that develops individuals' and, indeed, an occupation's capacities to act in various environments. It is asserted that vocational education should teach people how to be members of social as well as industry environments. Teachers, we conclude, must both directly and indirectly have a stake in the ongoing development of CBT, rather than simply reacting to CBT as it is imposed on them, if the best educational outcomes of the CBT policy are to be realised. In an important sense, while CBT undoubtedly has had and will continue to have effects on teachers, teachers must also have effects on CBT.

In the next section, the findings from the three sub-projects are brought together to offer a response to the overall research question.

The development of a flexible and adaptable workforce

This section seeks to consolidate the findings of the three sub-projects reported above. It does this by seeking both common and distinctive findings from these projects. The overall question for the project is:

> *How useful has competency-based training been as a model of curriculum development, assessment and instruction in securing the governmental goal of developing an adaptable and flexible workforce?*

In order to respond to this question those factors that are most likely to secure the governmental goal of developing an adaptable and flexible workforce are discussed first, before judgements about the actual contribution of CBT are provided.

One of the difficulties with this project has been that, despite the best efforts of researchers and subjects, clear evidence to support the subjects' views was not always forthcoming. For example, many students made statements about the worth of CBT and current VET provisions yet did not furnish evidence or instances to support their cases. In response, in each of the sub-projects the researchers have gone to considerable efforts to ground their analyses in actual instances and other forms of evidence. From these analyses deductions have been advanced and summarised above. Here, these analyses and deductions are brought together to provide some overall conclusions about the efficacy of CBT in securing an adaptable and flexible workforce. This is the commonly agreed goal for vocational education; that it should be concerned with developing these attributes in individuals. This goal has benefits for the individuals themselves in assisting them realise both their personal and vocational goals. Further, it has benefits for the enterprises that need these skills to deploy staff widely, and have expectations that they will be able to manage routine as well as novel tasks. Industry expects that workers will be able to adapt to change and move from one enterprise to another.

As argued in chapter 2, adaptability and flexibility are associated with the possession of the knowledge required for performance within a domain of practice (e.g. a particular vocation). This knowledge comprises developing the routinised and more consciously applicable strategic procedures, basic factual and richly interlinked conceptual knowledge, and dispositions associated with vocational practice. However, domains of knowledge are not detached from actual practice. So, for instance, there can be no confidence that knowledge developed in one context will be transferable to another unless the understanding (richly interlinked knowledge), strategic procedures and the privileging of that knowledge (what is valued) can account for the different circumstances of its deployment.

Hence, in terms of adaptability and flexibility, the goals for curriculum, assessment and teachers' work include identifying the kinds of knowledge that is required and the experiences needed for students to develop this knowledge, finding the means for furnishing experiences that develop this knowledge, and making judgements about students' attainment of that knowledge. The discussion in the three sections above has focussed on these activities. Taken under these three headings, the means by which the current VET arrangements are meeting these needs are discussed next. This is followed by deliberations about CBT's role in these activities. The reason this approach has been adopted is as follows. Developing flexibility and adaptability (the clever country, skilfulness) has been the key task given to vocational education. As noted, it has benefits for individuals, enterprises and industry. CBT was introduced to realise a

more flexible and adaptable workforce. Consequently, commencing with this overall policy goal provides a basis to discuss the contribution of CBT and also to advance views about what adjustments are required in curriculum development, assessment procedures and teacher practice.

The statements that follow comprise deductions from the data categorised according to the three activities identified above.

Knowledge required for adaptability and flexibility and how students may develop this knowledge

With respect to identifying the knowledge required for students to become flexible and adaptable, and experiences that are available for students to develop this knowledge, the data suggest that:

- The determination of intents and content by industry/enterprises assists in making the goals for, and content of, courses relevant. The identification of knowledge used in work places and in what combinations that knowledge is deployed is crucial in identifying these goals and content (e.g. what array of skills comprises a tradeworker, and how is this manifested in different enterprises?).
- Currency of teachers' workplace knowledge assists learners to develop transferable knowledge, and fosters the transfer of that knowledge to applications other than those practised in college settings. Understanding the range of circumstances where knowledge is applied provides a basis for assisting students' development of variations in the use of vocational knowledge (e.g. different kinds of service are required in different kinds of hospitality enterprises).
- Experience in the workplace is important for developing knowledge applicable to workplace settings. Developing understanding and procedures are particularly associated with workplace performance. In particular, the development of routine skills is unlikely to be secured if the activities tend to be non-routine experiences. Integrated programs or part-time work is important in proceduralising and developing associations within understanding.
- Diverse instructional approaches, when combined, can provide students with access to problem-solving and the reinforcement of knowledge. For example, working with others provides access to knowledge which learners may not discover themselves. Other approaches known to develop adaptability and flexibility include group learning, self-directed learning, and teacher-guided activities.
- Project work, self-directed learning and combinations of on- and off-job experiences also have potential to develop the forms of knowledge which permit transfer, hence adaptability and flexibility.
- Teachers and industry/enterprises desire assessment processes that reflect and encourage adaptability.

Providing experiences that develop knowledge for becoming flexible and adaptable

With respect to providing appropriate experiences that develop required knowledge for students to become flexible and adaptable, the data suggest that:

- Valuing a strong student focus in organising appropriate experiences, tailoring arrangements to the needs of learner, and providing support and guidance underpinned by currency of knowledge, are important aspects of teachers' work.
- Teachers' involvement in selecting and providing appropriate kinds of experiences is essential in order to determine how best these experiences should be organised for a given group or individual.
- Currency of knowledge about different kinds of workplaces is required by teachers in order for them to develop appropriate experiences for students.

- Direct engagement by teachers with students is required in order for teachers to understand student needs and to organise experiences and guidance appropriate to their level of development.
- It is important for teachers to identify and determine learner needs at the situational level and to respond to those needs.

Making judgements about students' attainment of knowledge required for flexibility and adaptability

With respect to making judgements about students' attainment of the knowledge required for flexibility and adaptability the data suggest that:

- There is a need for performance indicators to reflect the complexity, depth, routineness and non-routineness of the vocational activities being assessed.
- There is a need for teachers to assess the ability of students to engage in non-routine activities, as well as routine activities.
- There is a need for assessment to account for situational factors, and to validate these through functional application. For instance, on-the-job assessment is likely to indicate validity in terms of authentic practice.
- Dispositional factors (values, attitudes) need to be assessed as these qualities underpin the thinking and acting processes valued by government, industry and enterprises alike.
- Multiple integrated learning outcomes need to be assessed as these reflect requirements for work practice (e.g. project work as the basis for assessment).

The above are summary statements about the development of adaptability and flexibility drawn from the data analysis and presented in ways consistent with the orientations outlined in chapter 2. In order to understand CBT's role in the development of adaptability and flexibility, in the next section relationships between what has been advanced and CBT are discussed. Then relationships between the findings above and the broader CBT movement are discussed and, after that, attention is given to practice that is separate from these two considerations.

CBT and the development of flexibility and adaptability

It is proposed in chapter 2 that the core of CBT comprises competency standards, prescriptive syllabuses, modularised materials, assessment against competency standards, and procedures which align competency standards with curriculum documents and certification of courses. This has been the case up until the implementation of Training Packages arrangements, which marginalise curriculum documents as mandated aspects of CBT. The character and scope of this view is drawn from what government proposed at the time of the implementation of CBT.

As foreshadowed above and in earlier chapters, there is little evidence of linkages between CBT itself, as defined by its sponsors, and the development of a skilful and adaptable workforce. Most of the factors identified in the previous section refer to factors associated with the broader movement for reform of vocational education and factors which existed prior to the introduction of CBT and remain unaffected by it.

CBT's contribution

What can be concluded from the above is that the development of national industry standards shifted the focus of determining intent and content from within the vocational education system to external (industry) sources. This has led to a process that seeks greater relevance and currency in both the content and intents of VET programs. This shifting of focus has been institutionalised and formalised in a way

that may not have existed before (national curriculum, and more recently, Training Packages) although, in doing so, other qualities may have been lost in the formation of the intended curriculum, including local input and the insights of educators. Other contributions include the press brought about by the accreditation and registration processes for courses to be implemented in accordance with external demands and by the arrangements that attempt to maintain teachers' industry currency. Of course the situation is more complicated than these quick generalisations suggest. However, it would be wrong to assume that all teachers' practices were wholly motivated by concerns for the student, and that these measures may have in some ways provided a basis for enhancing the relevance of courses and for providing a clearer understanding of goals for learning which assist transfer. Also, in an unrelated form (but one sometimes associated with flexibility) students now enjoy access to national uniform certification that may assist career portability and advancement.

Conceptually, the key antagonism between CBT and the development of adaptability and flexibility is in CBT's focus on outcomes rather than process. Process concerns are ones of educational orientation and practice. This antagonism manifests itself as follows:

- standards based upon measurable performance de-emphasise the processes of thinking and acting which make these performances possible and which can most sensibly inform future performance (e.g. transfer and adaptability)
- the development of detailed national standards makes the intents of education remote from the circumstances in which performance is to be judged, thereby denying the requirements of performance at the local level (e.g. requirements of local individuals and enterprises)
- the development of standards is disengaged from the individuals who have to teach and assess against those standards (e.g. teachers and trainers)
- the means by which national curriculum prescriptions are imposed upon the training system and its clients is associated with mandation rather than with processes which develop teachers' commitment to them
- the importance of approaches to instruction likely to secure skilfulness are down-played
- the validity of mandated assessment processes is currently being jeopardised by the failure of CBT, in its present form, to address the qualities associated with adaptability and flexibility

Put simply, the current form of CBT delivery and assessment overlooks much of the thinking and acting which determines effective flexible and adaptable performance. The current national focus towards greater uniformity, the sole use of behavioural objectives and the undervaluing of pedagogic expertise misrepresents the complexity of vocational knowledge, its situatedness, the teaching and assessment of that knowledge and the basis by which individuals commit themselves to their practice.

There is little evidence, either in the data gathered and analysed for this study, or in the broader body of knowledge, that CBT itself has contributed much to the development of flexibility and adaptability. It is more likely that some of the components of the broader reform movement have had far more effect than CBT itself; as is discussed in the next section. In the following section the clearest evidence suggests that the governmental goals of adaptability and flexibility were most likely to be secured by teaching practices, and experiences and arrangements, that had little to do with CBT.

The broader reform movement and the development of flexibility and adaptability

The broader reform movement refers to a raft of associated procedures aimed at securing the reform of, and responsiveness within, the nation's vocational education

system. The parameters of this movement constantly changed throughout the decade of CBT. For instance, at its inception CBT was only to be applied to trade courses (Watson 1991). However, later it encompassed all courses in TAFE and then finally the broader field of VET. More recently the shift has been from an industry focus to an enterprise focus. Associated with the CBT movement from its inception has been the relationship between self-pacing and CBT. Over time this relationship has facilitated the move to workplace delivery and assessment. Also, the move to a training market has seen a shift in provisions that seek to address more directly the needs of local circumstances, individuals and enterprises (Billett & Hayes 1998).

Contribution of the reform process

Whereas industry accreditation pressed for currency of skills, the shift to interactions with enterprises is now reported to have led to a greater understanding of the goals for learning and the needs of enterprises. Such understandings are important to the development of knowledge that is applicable in at least one target circumstance. For instance, what the much prized multi-skilling means can only be determined at the local level through an understanding of the range of activities being enacted in a particular workplace. So, it seems, identification of enterprise needs is being addressed through interactions brought about, at least in part, by market reforms.

Associated with market reforms is the reported enhanced relevance of programs that include the provision of authentic experiences to students through workplace activities. Such activities have increased as opportunities for students to participate in programs which integrate workplace and classroom experiences have increased. And, it should be noted, workplace training and assessment has been promoted by VET policy for some years now. These experiences provide students with access to the situatedness of vocational practice and provide opportunities for them to engage in authentic activities likely to secure vocational knowledge. As noted above, workplaces offer students the opportunity to engage in problem-solving in authentic environments, to draw upon the contributions of those environments in the development of applicable and richly-linked knowledge. Also, workplaces provide combinations of routine and non-routine experiences. It is this combination of experiences that is so important in the development of robust knowledge through a process of construction and reinforcement. Typically, classroom activities are more likely to provide non-routine experiences that may not furnish opportunities for students to proceduralise and richly interlink knowledge.

Yet, the broader reform or CBT movement did bring about changes in experiences that students encountered in the classroom. These included self-paced learning and text-based learning and arrangements that may press learners into the kinds of thinking and acting that develop adaptability and flexibility. While this approach did not suit all learners, those who were 'ready' enough to engage suggested they enjoyed the benefits this approach to learning provided. Equally, there were many references in the data to individualised learning that was aimed at meeting individuals' needs. Overall, some of the outcomes of the broader reform movement appear to focus on students in ways that furnish and support opportunities for them to develop the knowledge required for flexibility and adaptability.

Throughout the 1990s, it seems there has been a broadening of the teacher's role to accommodate some of the demands of market-based arrangements, and to address enterprise needs. This broader role may offer teachers the prospect of better understanding of learner needs, more discretion in determining intents and content for courses, and a greater capacity to provide the kinds of experiences that students need in order to acquire workplace knowledge. However, such optimism must be countered by concerns about reductions in funding which are reported to have curtailed many of these experiences and reduced the availability of teachers and the duration of programs.

On another focus, it could be expected that, by enhancing the prospects for enterprise needs to be met, greater and broader participation in VET would result. Unfortunately, there is little evidence to suggest that these provisions have enhanced either the quantity or quality of enterprise participation in VET.

It is suggested that the broader reform movement, more so than CBT itself, has resulted in changes that have assisted the development of adaptability and flexibility. Yet, beyond these changes, many of the pre-existing practices within VET are likely to have secured the kinds of outcomes required for flexibility and adaptability. These practices are discussed next.

Factors other than those associated with the development of CBT

In overview, a range of approaches comprising existing instructional and curriculum practices and provided mainly by teachers are likely to be instrumental in the development of flexibility and adaptability. CBT and the broader reform movement have overlooked many of these contributions. However, as the findings in this project have shown, they are the kinds of experiences, activities and support that need to be strengthened and prioritised in future arrangements. Some of these are identified and discussed next.

Firstly, teachers' work in addressing learners' needs, and in tailoring curriculum experiences and direct instruction to the needs of particular groups of learners, are enduring qualities. This work appears to make a difference. For instance, in the data reporting concerns about self-paced and resource-based approaches, were references to mediation by teachers of these experiences to make them accessible and possible to be engaged by students. So while these approaches to instruction press students into independent yet guided learning for those not ready, or for whom the transfer task is too difficult, the teacher can play an important mediating role.

The full potency of integrated learning experiences can be realised by teachers making links and building on the contributions which various experiences provide. In this study, particularly in the responses from hospitality students, teacher knowledge of the workplace environments was held to be useful in integrating learning experiences. It is finding the means to develop understanding about the different kinds of knowledge application that is likely to be important for the development in students of transferable knowledge.

Group work experiences provided in VET institutions were also held to be useful in engaging students in simulated activities of the kind they would encounter in the workplace. Again, in the hospitality sector the practical group work (e.g. kitchen and restaurant work) furnished such opportunities and assisted in developing attributes of performance that are claimed to be most important in the contemporary workplace (e.g. key competencies). Significantly, it was claimed that reductions in funding have inhibited the frequency of these kinds of experiences.

Teacher-guided experiences in the classroom remain an important basis for learning. Students engage in activities that construct their knowledge and that are guided by a more expert other (the teacher). Knowledge is socially sourced and constructed and the close guidance of the teacher remains an important contribution to student knowledge building as exemplified in the data within this project. A concern of students was that access to teachers was often not as frequent as they needed. In the quantitative data, it has been shown that the perceived level of teacher support was lower in TAFE environments than in other environments such as schools.

The expertise of teachers and their skills in furnishing experiences and knowledge of their vocational domain were held to be important in providing the kind of guidance and experiences that are likely to assist students develop understanding and skills that are transferable.

Instructional practices such as project work, self-paced learning, problem-solving tasks and practical activities are also held to secure the kinds of outcomes that are associated with learners engaging knowledge and constructing it. Such activity is likely to provide a strong basis for knowledge and skills transfer.

These activities were commonly practised in vocational education prior to the national uniform implementation of CBT. They are less common now although the broader reform movement has intensified the use of some. Yet these activities have been shown to provide the best opportunities for developing flexibility and adaptability. Process concerns about how to best identify and develop the kinds of knowledge required for vocational performance need to be central to curriculum development and instruction, and in assessment practices. It is these considerations rather than pre-specified outcomes, a lack of emphasis on the learning process and behavioural objectives as a basis for assessment, that are required if vocational education is to secure the outcomes successive governments have demanded of it.

In advocating these views it is important to acknowledge that not all teachers have either the ability or interest in providing the kinds of experiences discussed above. The de-emphasis of professional preparation and practice and the reduction of the role of teachers are likely to inhibit the realisation of the requirements outlined. However, the quality of the experiences and the effectiveness of the guidance provided by teachers plays a critical role in the successful development of adaptability and flexibility in those who participate in VET.

Taking this theme and those advanced above, the next and final section sets out some alternative approaches for the management and organisation of VET which draw on the analysis and synthesis advanced in this chapter.

Recommendations

The recommendations set out below are focussed on the future and should be seen as suggested changes to advance CBT in ways that will ensure it more fully meets the government's intended agenda. We recommend ways in which CBT can contribute not only to the development of a skilful workforce, but to one that is also flexible and adaptable. Recommendations are presented under three headings associated with the separate areas of inquiry.

Curriculum

The recommendations advanced for curriculum are proposed in the form of revised considerations for accreditation and registration procedures. These revisions would focus on what should be included in the form of considerations of the *intended*, *enacted* and *experienced* curriculum for programs within VET. In overview, it is proposed that the kinds of educational intents used in vocational education need to be changed, as should the means by which they are determined. In terms of the enacted curriculum, it is held that the focus should be on the quality of experiences provided for the learners.

a) The *intended curriculum*: the kinds and quality of intents and content—The sole use of behavioural objectives unduly limits the realisation of vocational education goals. Therefore, process and value objectives ought to be considered alongside behavioural objectives. Where matters of performance are routine and observable, then behavioural objectives may suffice. However, non-observable phenomena such as procedures and understanding may not be easily measurable in the same way. Complex forms of thinking and acting require the use of process objectives to emphasise the centrality of learning activities in developing the knowledge required for adaptability and transfer. While there is a need to continue determining curriculum intents from external sources such as enterprises and industry, input from teachers and other individuals is likely to be useful in providing appropriate experiences. Teachers need to have a role in developing

curriculum as well as in implementing programs in order for deliberations to be informed by professional practice.

b) The *enacted curriculum*: the quality of experiences for learners—Modification to curriculum accreditation and registration processes are necessary in pressing for a consideration of teaching process factors, particularly those required for developing adaptability and skilfulness. Accreditation processes should specify the kinds of experiences that students should undertake in order to engage learners in the kinds of thinking and acting which are likely to lead to outcomes associated with performance. For example, problem-solving activities of routine and non-routine kinds, integrated workplace and classroom experiences, guided learning to secure understanding, and higher orders of procedural knowledge and group activities must be embedded in vocational activities. Moreover, accreditation and registration processes should specify how learners' readiness to engage in self-directed activities can be appraised and monitored, as well as the level of guidance required for those who are not ready for autonomous problem-solving.

c) The *experienced curriculum:* engaging the learners—Accreditation and registration procedures will benefit from a focus on how student engagement in activities and appropriate levels of support can be understood. In addition, a heightened emphasis on making links between classrooms and workplaces is required.

Assessment practice

If assessment in vocational education is to be both valid and reliable, changes are required. Hence, the recommendations on assessment are classified in terms of validity and reliability.

Validity

For assessment to be valid the bases for assessment (e.g. objectives) need to include the forms of knowledge that are to be assessed, circumstances in which performance actually occurs, and the need to assess both understanding as well as practice and dispositional attributes which are important for practice. Matters of complexity, authenticity, and integration need to be considered. In short, validity needs to be considered in the benchmarks upon which judgements about students' ability to be flexible and adaptable in their vocational domain can be made. Hence, it is recommended that benchmarks of kinds other than behavioural objectives be developed and that there be more negotiation about the basis of the detail of those benchmarks in circumstances where an understanding of the situational factors can also be included.

Reliability

Measures to assist reliability of assessment were largely overlooked in the decade of CBT, apart from the use of standards and outcome statements. Now, with the greater diversity of applications, measures of reliability need to be developed to maintain the standing of judgements about student performance and the standing of certification within vocational education. So while there may be differences in the detailing of intents against which assessment will be made, approaches such as moderation will need to be considered in order to assist reliability. Again, professionally prepared educators are able to provide these kinds of outcomes.

Incentive

As discussed in chapter 5 and above, the issue of incentive is at the core of individuals' learning. Non-graded passes may remove a key source of incentive for learners. The kinds of knowledge that individuals will need to learn in order to be flexible and adaptable are of the kind that require effort on the part of the learner. Removing incentives in the form of graded passes may remove an incentive for engagement in the difficult and demanding act of learning these forms of knowledge. Hence, it is

proposed that some form of graded assessment that recognises the skills required to be adaptable and flexible be re-introduced to provide important incentives for learners.

Teachers' practice

The key recommendations for teachers' practice are about providing the bases for teachers to deliver to students the kinds of opportunities, experiences and guidance that will enable them to develop their adaptability and flexibility. These recommendations are classified under broadening the role of teachers, deepening the role and developing teachers' practice.

a) *Broadening teachers' role*—Teachers need to be more than implementers. They need to be engaged as adapters, developers and researchers. Teachers need to have more discretion within the enacted curriculum to allow them to act upon their judgements of the best integration of routine and non-routine experiences and the best combination of independent, group and teacher-led experiences. This deeper involvement will allow teachers to better determine and respond to individuals' needs, and to guide them in developing their adaptability and skilfulness.

b) *Deepening teachers' role*—The value of pedagogic expertise needs to be acknowledged hand-in-hand with vocational knowledge. The development of complex forms of knowledge is not straightforward. The contemporary role of teachers as guides in the construction of learners' knowledge requires them to have different kinds of expertise to that required for didactic instructional strategies. Moreover, teachers need to understand how to effectively use combinations of experiences within different learning environments. Thus a greater emphasis on pedagogic principles and practices is needed.

c) *Developing teachers' knowledge*—Developing broader and deeper roles for teachers requires them to give more attention to the professional practice side of teachers' work. This means that professional preparation for vocational educators should be both thorough and comprehensive, and that professional development should emphasise pedagogic as well as vocational aspects of practice.

Concluding comments

It is now ten years since a uniform system of CBT was introduced into the Australian vocational education system as a result of government policy. As a consequence, the last decade has seen significant changes in the structure and organisation of the country's vocational education system. Changes include a broadening of the field of providers of vocational education that is best characterised as a shift from TAFE to VET. There has also been a shift from national prescriptions founded on industrial awards to an enterprise-based focus. However, enduring through the decade has been the key goal for vocational education, through CBT, to develop a flexible and adaptable workforce capable of competing globally. The findings from this project suggest that to achieve these goals, measures beyond CBT are required.

It has been recommended that changes to the approaches used to determine both the intents and content of vocational education are required. But more than that, there is a need for a change in emphasis in policy to grant a greater role for the educational process—the activities and roles of teachers and the kinds of activities and guidance that students engage in. The evidence presented suggests that a continued focus upon CBT in its current form is unlikely to secure the desired outcomes. Instead, approaches to curriculum and assessment need to be transformed to recognise the critical role of teachers in achieving the country's need for a flexible, adaptable and globally competitive workforce.

Notes

1 Skilfulness here is accepted in its broadest meaning which includes the development of capacities (conceptual, procedural and dispositional) required to engage in a vocation. Vocation here is also taken at its broadest meaning (e.g. being a parent, a classical scholar or a plumber is practising a vocation). Activities of both of a routine and non-routine kind are included. Hence, they are transferable and desirable to individuals wishing to pursue their personal and career goals.

2 My copy of Bloom's taxonomy has annotations that date back to 1984. These annotations were used to link objectives of particular orders to the category system (A - B - C - D) used by TAFE Queensland at that time to classify course levels. *Stephen Billett*

3 It is acknowledged that with increased specialisation there may well be need for very specific and even equipment specific provisions of vocational education (e.g. aircraft mechanics and pilots). This is a transformation in the way vocations have traditionally been viewed and prepared for.

4 In the early 1990s, within the Queensland State training policy branch, it was initially stated that workplace provisions of vocational education would be exempt from CBT because its key focus was on reforming TAFE.

5 Note the work reported by Rumsey (1997) which is occurring in Western Australia and ACT. In these places, trails of graded assessment are progressing. For example, a graded approach to reporting competency-based assessment ('pass with merit') is being trialled. (WADT 1997) and similar arrangements are part of the assessment policy at the Canberra Institute of Technology (CIT 1996).

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Appendix 1: Chapter 3 tables

Table 3.12: Focus group (TAFE teachers)—concerns and items

Focus groups—TAFE teachers—two focus groups (one met, one non-met) for each industry	
Institutional practice influenced by CBT	
Concern (project#)	*Item*
Influence and role of national standards on CD (#4)	Are there differences between pre and post CBT priorities? (PC2)
Influence and role of accreditation procedures on CD (#4)	In what ways did the State accreditation process change your work? (PC3)
Teachers' fidelity to what was proposed in syllabus (#4)	To what degree do you currently feel compelled to be responsive to syllabus requirements? (PC2) To what degree did you feel compelled to be responsive to syllabus requirements? (prior to CBT) (AI11)
Addressing local enterprises' needs under CBT (#4)	What evidence supports the claim that industry and enterprise needs are being met? (OC6, OC7)
Addressing individuals' needs under CBT (#4)	What evidence is there that learning by trainees has improved with CBT? (OL8) In what ways have processes such as ROL and articulation improved career development? (OS3)
Ability of CBT to provide uniformity (#4)	Has greater uniformity of training been achieved? Please explain. (OS4)
Impact of behavioural objectives on CD, assessment and teaching (#4, #5, #6)	In what ways are the new relationships among industry, training managers, trainers and trainees productive? (OS2)
Changes to CD practice in TAFE (#4)	Indicate the range of tasks you undertook as an instructor before CBT, ways they are different to what you do now and the reasons for the difference. (AC2) Before CBT who or what determined what was taught and how it was taught? (AI10)
Impact of non-graded pass (#5)	Please list the strengths of the pre-CBT approach to assessment. (AA6) How does a non-graded pass approach influence motivation to learn? (OL10)
Changes to assessment practices in TAFE environments (#5)	Please list the key strengths of the CBT approach to assessment. (AA6) Please list the shortcomings to the pre-CBT approach to assessment. (AA7) Give examples of how your assessment practices changed. (PA5) How were these changes in assessment brought about? (PA6) Can you provide examples of how assessment practices address trainees' needs? (OL11) How would you change assessment practices to both improve and acknowledge students' performances? (FA2)
Impact of associated assessment practices (e.g. RPL) (#5)	In what ways have processes such as RPL and articulation improved career development? (OS3)
Impact of CBT on teaching practice in TAFE settings (#6)	Indicate the range of tasks you undertook as an instructor before CBT, ways they are different to what you do now and the reasons for the difference. (AC2) What effect has CBT had on the support provided for students' learning? (PI4) What has CBT come to mean to you? (PE8) How would you change instruction to best develop student learning? (FI1)

Table 3.12: Focus group (TAFE teachers)—concerns and items continued

Concern (project#)	*Item*
Impact of modularisation and self-pacing (#6)	What has CBT come to mean to you? (PE8) What evidence is there that learning by trainees has improved? (OL8) What effect has CBT had on the support provided for student's learning? (PI4)
Impact of accreditation frameworks on instruction (#6)	In what ways did the State accreditation process change your work?
Changing teaching practice in TAFE (#6)	What effect has CBT had on the support provided for students' learning? (PI4) Indicate the range of tasks you undertook as an instructor before CBT, ways they are different to what you do now and the reasons for the difference. (AC2)
Educational worth of CBT	
How CBT addresses needs of individuals (#4)	What effect has CBT had on the support provided for student's learning? (PI4) What evidence is there that learning by trainees has improved with CBT? (OL8)
Purposefulness of behavioural objectives (delivering flexibility and adaptability) (#4)	What evidence supports the claim that industry and enterprise needs are being met? (OC6, OC7) In what ways are the new relationships among industry, training managers, trainers and trainees productive? (OS2)
Behavioural objectives and assessment: validity and reliability (#5)	Can you provide examples of how validity and reliability of assessment has been affected under CBT? (OL12)
CBT and achievement of uniformity (reliability) (#5)	Has greater uniformity of training been achieved? Please explain. (OS4)
Utility of CBA to judge higher order procedures and deep conceptual knowledge (non-quantifiable outcomes) (#5)	In what ways are trainees able to solve problems on their own or collaboratively? (OK15) How would you change assessment to both improve and acknowledge student's performance? (FA2)
How to assess higher order procedures and deep conceptual knowledge (non-quantifiable outcomes) (#5)	Can you provide examples of how assessment practices address trainees' needs? (OL11) How would you change assessment to both improve and acknowledge student performance? (FA2)
Appropriateness of CBT for developing skilfulness and adaptability (#6)	In what ways are trainees able to solve problems on their own or collaboratively? (OK15) What evidence supports the claim that industry and enterprise needs are being met? (OC6, OC7)
Consequences of teacher as a 'mere' implementer (#6)	Indicate the range of tasks you undertook as an instructor before CBT, ways they are different to what you do now and the reasons for the difference. (AC2) How would you change instruction to best develop students' learning? (FI1) How should curriculum be best developed for your industry? (FC3)
Opportunities for students to engage in joint problem-solving etc. (#6)	In what ways are trainees able to solve problems on their own or collaboratively? (OK15)
Provision of guidance in the classroom (#6)	What effect has CBT had on the support provided for students' learning? (PI4) Indicate the range of tasks you undertook as an instructor before CBT, ways they are different to what you do now and the reasons for the difference. (AC2)

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Table 3.13: Oral histories (TAFE teachers)—concerns and items

Oral histories—TAFE teachers—six per State—three per industry	
Institutional practice influenced by CBT	
Concern (project#)	*Headings (Items)*
Influence and role of national standards on CD (#4)	What evidence is there that CBT has changed VET practice for the better or worse? (OS1) In what ways are the new relationships among industry, training personnel and trainees productive or unproductive? (OS2) To what degree did you enjoy freedom (pre CBT) in what was taught and how it was taught? (AI10)
Influence and role of accreditation procedures on CD (#4)	How did the process of accreditation change your work? (PC3)
Teachers' fidelity to what was proposed in syllabus (#4)	To what degree were you responsive to syllabus requirements [prior to CBT]? (AI11)
Addressing local enterprises' needs under CBT (#4)	What evidence is there that changed training practices are developing skills that improve competitiveness? (OC6) What evidence supports the claim that enterprise/industry goals are being met? (OC7) Can you provide examples of how training and assessment practices address the needs of trainees and employers? (OL11)
Addressing individuals' needs under CBT (#4)	In what ways has greater uniformity of training been achieved? (OS4)
Ability of CBT to provide uniformity (#4)	What evidence is there that learning by trainees has improved? (OL8)
Impact of behavioural objectives on CD, assessment, teaching practice (#4, #5, #6)	In what ways are the links between assessment and credentials important? (OL9) What interactions between industry and instructors are valuable in promoting skilfulness in trainees? (OK16) In what ways are employees trained under the new VET system knowledgeable and skilful? (OK17) What evidence is there that trainees are able to transfer knowledge and skills to new situations and changed work practices? (OK18)
Changes to CD practice in TAFE (#4)	[Before CBT] what was your role in the development of training programs? (AC1) What changed in the ways training needs were established in your industry [during initial implementation of CBT]? (PN1)
Impact of non-graded pass (#5)	How does a non-graded pass approach influence motivation to learn? (OL10)
Changes to assessment practices in TAFE environments (#5)	Can you provide examples of how training and assessment practices address the needs of trainees and employers? (OL11) In what ways are the links between assessment and credentials important? (OL9) In what ways were your assessment practices changed? (PA5) How were the changes in assessment brought about? (PA6)
Impact of associated assessment practices (e.g. RPL) (#5)	In what ways have processes such as RPL and articulation improved or inhibited career development? (OS3)
Impact of CBT on teaching practice in TAFE settings (#6)	Can you give examples of how your work as a trainer has changed? (OL13) What evidence is there that CBT has changed VET practice for the better or worse? (OS1)

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Table 3.13: Oral histories (TAFE teachers)—concerns and items continued

Concern (project#)	*Item*
Impact of modularisation and self-pacing (#6)	What effect was there on the support given for learning? (P14) What evidence is there that learning by trainees has improved? (OL8) Can you provide examples of how training and assessment practices address the needs of trainees and employers? (OL11) In what ways are employees trained under the new VET system knowledgeable and skilful? (OK17)
Impact of accreditation frameworks on instruction (#6)	How did the process of accreditation change your work? (PC3)
Changes to teaching practice in TAFE (#6)	What changes have affected you the most? (OS5) How would you change instruction to best develop students' learning? (FI1)
Educational worth of CBT	
How CBT addresses the needs of individuals (#4)	What effect was there on the support given to learning? (PI1) What evidence is there that learning by trainees has improved? (OL8) Can you provide examples of how training and assessment practices address the needs of trainees and employers? (OL11)
Purposefulness of behavioural objectives (delivering flexibility and adaptability) (#4)	What evidence is there that changed training practices are developing skills that improve competitiveness? (OC6) What evidence supports the claim that enterprise/industry goals are being met? (OC7) What interactions between industry and instructors are valuable in promoting skilfulness in trainees? (OK16) What evidence is there that trainees are able to transfer knowledge and skills to new situations and changed work practices? (OK18)
Behavioural objectives and assessment: validity and reliability (#5)	In what ways are the links between assessment and credentials important? (OL8) Can you provide examples of how training and assessment practices address the needs of trainees and employers? (OL11)
Achievement of uniformity (reliability) (#5)	In what ways has greater uniformity of training been achieved? (OS4)
Utility of CBA to judge higher order procedures and deep conceptual knowledge (non-quantifiable outcomes) (#5)	In what ways are trainees able to solve problems on their own or collaboratively? (OK15) What evidence is there that trainees are able to transfer knowledge and skills to new situations and changed work practices? (OK18)
How to assess higher order procedures and deep conceptual knowledge (non-quantifiable outcomes) (#5)	Can you provide examples of how training and assessment practices address the needs of trainees and employers? (OL11) Can you provide examples of how reliability and validity of assessment are established? (OL12) How would you improve assessment to both improve and acknowledge student performance? (FA2)
Appropriateness of CBT for developing skilfulness and adaptability (#6)	What evidence is there that changed training practices are developing skills that improve competitiveness? (OC6) What evidence supports the claim that enterprise/industry goals are being met? (OC7)

Table 3.13: Oral histories (TAFE teachers)—concerns and items continued

Concern (project#)	*Item*
Consequences of teacher as a 'mere' implementer of curriculum (#6)	What evidence is there that CBT has changed VET practice for the better or worse? (OS1) What did CBT come to mean to you? (PE8) How did the changes in curriculum organisation affect your work? (PC1)
Opportunities for students to engage in joint problem-solving etc. (#6)	In what ways are trainees able to solve problems on their own or collaboratively? (OK15)
Provision of guidance (#6)	What effect was there on the support given for learning? (PI4)

Table 3.14: Questionnaire for students— concerns and items

Focus groups—Students—Six classes (both met and non-met) for each industry in TAFE environments and the same for non-TAFE environments	
Institutional practice influenced by CBT	
Concern (project#)	*Headings (Items)*
Addressing individuals' needs under CBT (#4)	Can you provide examples of how training and assessment practices address your needs and those of employers? (OL11)
Changes to assessment practices in TAFE environments (#5)	What recent changes to training and assessment have affected you most? (OS5)
Impact of non-graded pass (#5)	How does a non-graded pass approach influence your motivation to learn? (OL10)
Impact of associated assessment practices (e.g. RPL) (#5)	In what ways have processes such as RPL and articulation improved or inhibited career development? (OS3)
Impact of modularisation and self-pacing (#6)	Can you provide examples of how training and assessment practices address your needs and those of employers? (OL11) Can you provide examples of where training has helped you solve problems on your own or with others? (OK15)
Educational worth of CBT	
How CBT addresses the needs of individuals (#4)	Can you provide examples of how training and assessment practices address your needs and those of employers? (OL11)
Opportunities for students to engage in joint problem-solving etc. (#6)	Can you provide examples where training has helped you solve problems on your own or with others? (OK15)

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Table 3.15: Focus group/workshops—(labour market programs, private providers and workplaces)—concerns and items

Focus groups—(labour market programs, private providers and workplaces)—two focus groups (one met one non-met) for each industry	
Institutional practice influenced by CBT	
Concern (project#)	
Influence and role of accreditation procedures on CD (#4)	In what ways did the State accreditation process change your work? (PC3)
Addressing individuals' needs under CBT (#4)	What effect has CBT had on the support you were able to provide for students? (PI4)
Ability of CBT to provide uniformity (#4)	Has greater uniformity of training been achieved? Please explain. (OS4)
Impact of non-graded pass (#5)	How does a non-graded pass approach influence motivation to learn? (OL10)
Changes to assessment practices in instructional environments [non-TAFE] (#5)	Give examples of how your assessment practices changed. (PA5)
Impact of associated assessment practices (e.g. RPL) (#5)	In what ways have processes such as RPL and articulation improved career development? (OS3)
Impact of CBT on teaching practice in non-TAFE settings (#6)	In what ways did the State accreditation process change your work? (PC3)
Impact of modularisation and self-pacing (#6)	What has CBT come to mean to you? (PE8)
Impact of accreditation frameworks on instruction (#6)	In what ways did the State accreditation process change your work? (PC3)
Changes to teaching practice in non-TAFE settings (#6)	How would you change instruction to best develop student's learning? (FI1)
Educational worth of CBT	
How CBT addresses needs of individuals (#4)	What effect has CBT had on the support you were able to provide for students' learning? (PI4) Can you provide examples of how assessment practices address trainees' needs? (OL11)
Purposefulness of behavioural objectives (delivering flexibility and adaptability) (#4)	In what ways are the new relationships among industry, training managers, trainers and trainees productive? (OS2)
Behavioural objectives: validity and reliability (#5)	Can you provide examples of how reliability and validity of assessment has been effected? (OL12)
Utility of CBA to judge higher order procedures and deep conceptual knowledge (non-quantifiable outcomes) (#5)	In what ways are trainees able to solve problems on their own or collaboratively? (OK15)
Securing validity across diverse assessment situations #5	Can you provide examples of how reliability and validity of assessment has been effected? (OL12)
How to assess higher order procedures and deep conceptual knowledge (non-quantifiable outcomes) (#5)	In what ways are trainees able to solve problems on their own or collaboratively? (OK15)
Appropriateness of CBT for developing skilfulness and adaptability (#6)	What evidence supports the claim that industry and enterprise needs are being met? (OC6, OC7)
Consequences of teacher/instructor as a 'mere' implementer (#6)	How should curriculum development best be developed for your industry/enterprise? (FC3)
Opportunities for students to engage in joint problem-solving etc. (#6)	In what ways are trainees able to solve problems on their own or collaboratively? (OK15)
Provision of guidance (#6)	What effect has CBT had on the support you were able to provide for students' learning?

Table 3.16: Interviews with industry reps

Interviews with industry reps (Curriculum officers and ITAB reps—two each per industry, eight in total)	
Institutional practice influenced by CBT	
Concern (project#)	*Item*
Influence and role of national standards on CD (#4)	How did the relationships among industry, training personnel and trainees change? (PC2)
Influence and role of accreditation procedures on CD (#4)	How did the processes of accreditation change your work? (PC3)
Bi-partite industry influence on CD (#4)	How did the relationships among industry, training personnel and trainees change? (PC2)
Addressing individuals' needs under CBT (#4)	What evidence is there that learning by trainees has improved? (OL8) Can you provide examples of how training and assessment practices address the needs of trainees and employers? (OL11)
Addressing individual enterprise needs with CBT (#4)	Can you provide examples of how training and assessment practices address the needs of trainees and employers? (OL11) What evidence supports the claim that enterprise/industry goals are being met? (OC7)
Changes to CD practice in TAFE and non-TAFE environments (#4)	How did the relationships among industry, training personnel and trainees change? (PC2) How did the processes of accreditation change your work? (PC3)
Educational worth of CBT	
How is it addressing the needs of 'industry'? (#4)	In what ways are the new relationships among industry, training personnel and trainees productive or unproductive? (OS2) What evidence supports the claim that enterprise/industry goals are being met? (OC7)
How it addressed needs of individuals (#4)	What evidence is there that learning by trainees has improved ? (OL8) How does a non-graded pass approach influence student's motivation to learn? (OL10)
Consequences of teacher as a 'mere' implementer (#6)	How would you change instruction to best develop student learning? (FI1) How should curriculum best be developed for your industry/enterprise? (FC3)

Table 3.17: Interviews with local enterprises

Interviews with local enterprises (4 per each industry per State)	
Institutional practice influenced by CBT	
Concern (project#)	*Item*
Bi-partite industry influence on CD (#4)	How did the relationships among industry, training personnel and trainees change? (PC2)
Addressing individual enterprise needs with CBT (#4)	What evidence supports the claim that enterprise/industry goals are being met? (OC7) Can you provide examples of how training and assessment practices address the needs of trainees and employers? (OL11)
Educational worth of CBT	
How is CBT addressing the needs of 'industry'?(#4)	In what ways are the new relationships among industry, training personnel and trainees productive or unproductive? (OS2) What evidence supports the claim that enterprise/industry goals are being met? (OC7)
How it addressed needs of local enterprises (#4)	Can you provide examples of how training and assessment practices address the needs of trainees and employers? (OL11)
Utility of CBT for learning in the workplace (#4)	What evidence is there that learning by trainees has improved? (OL8)

Appendix 2: Chapter 4 tables

Table 4.1: Curriculum orientations
(from Blachford, K 1986, *Orientations to curriculum in TAFE*, Hawthorn Institute of Education, Melbourne, Victoria)

	Curriculum as technology	Curriculum as cognitive process	Curriculum as humanism	Curriculum as social-relevance/reconstruction
Context evaluation as	'Objective' needs assessment, job analysis etc.	Nature of current knowledge	Student-teacher interactions; needs, concerns	Social analysis, justice, equity
Responsive to	Powerful external interests	Changing needs of external interests	Student need for self-actualisation	Minorities, disadvantaged, powerless; nature of participatory democracy
Concept of student as	Imitator	Reinventor	Potential self-actualiser	Social agent, critic, activist
Goals as	Behavioural objectives (non-problematic, specific ends)	Cognitive skills, concepts, principles	Cognitive/affective, personal growth, self-actualisation	Social processes especially social participation; value pluralism, rational debate
Key focus	Objectives (of others)	Problems (of others)	Concerns (of others)	Social issues
Scheduling	Fixed sequence(s) perhaps self-paced	Flexible, responsive to direction of inquiry	Responsive to student concerns and rational rules	Negotiated, tactical sequence within time limits
Curriculum materials	Preordinate including teaching machine programs	Problem-centred variety of information, modes of presenting information	Responsive to student concerns, variety of experiences	Variety of 'real' materials, direct involvement with outside world situations
Teaching methods	Controlled, small steps, immediate feedback	Exploration of hypotheses leading to 'discovery'	Interactive groups and individual reflection	Co-operative group work
Assessment	Congruence with objectives	Indicators of thinking; assessor judges skills profile	Personal meaning of studies for students; extended profiles	Civic competence, competence in various real situations especially political
Curriculum administration	Centralised manager-based	Centralised scholar-based	Devolved to teacher-student	Developed to college, class, community
Course evaluation approaches	Managerial e.g. tests	Professional e.g. inspection, decisional, accreditation models	Professional e.g. case study, illuminative models	Participation e.g. responsive, quasi-legal, action research models

Table 4.2: Subjects' knowledge of CBT prior to its national implementation (AC4)

Aware of:	Subjects	Sources (see note)
'Knowledge of it'		
Nothing/very little	402, 409, 430, 431, 404, 407, 406, 408, 411, 432, 420, 424, 425, 421, 428, 423, 412, 434,918, 910, 909, 908, 902	H(9) M(7) VH(2) VM(3)
Knew of it, but not how it worked	413, 405, 400, 427, 919	H(2) M(2) VM(1)
Thought we were already doing it	917, 913, 912, 903	VH(1) VM(3)
'Knowledge of its aims'		
Outcome-based (competency in the workplace)	427, 422, 416,919, 917, 914, 904,	H(1) M(2) VM(2) VH(2)
National industry standards-based	416, 414, 923, 922, 921, 917, 911	M(1) H(1) VH(1) VM(4)
Generic	922, 921	VM(2)
It will make a better workforce	401	M(1)
Improve quality of VET provisions	416	M(1)
Claims greater rigour	919	VM(1)
It will suit all learning styles	401	M(1)
'Knowledge of its processes'		
Familiar with similar educational models	410, 919, 916, 905	H(1) VM(2) VH(1)
Teacher as a resource	903	VM(1)
Self-pacing of materials	417, 913, 912, 901	M(1) VM(3)
Erodes quality of teaching and learning	920	VM(1)
Changed conditions for assessment	415, 910, 907	M(1) VH(1) VM(1)
Modular approach	923, 907	VH(1) VM(1)
Mastery learning	907	VM(1)
Non-graded pass	923	VH(1)
Competency exams	914	VM(1)
Somewhat inflexible	922, 921	VM(2)
'Knowledge of its association'		
Associated with workplace reform	429, 418, 422, 414,	M(3) H(1)
Confusion among staff	415, 434, 912, 901	M(2) VM(2)
Favours large enterprises	922, 921	VM(2)
Trade training	920	VM(1)

Note: M = Qld Metals, H = Qld Hospitality, VM = Vic. Metals, VH = Vic. Hospitality.
In the left-hand column summary statements about the teachers' knowledge of CBT are presented. The responses have been ordered under four categories of responses: 'knowledge of CBT', 'knowledge of CBT aims', 'knowledge of CBT processes' and 'knowledge of CBT associations'. The centre column identifies subjects' responses that are in agreement with those statements. In the right hand column are details of the source of the responses.

Table 4.3: Freedom to teach and selection of techniques (AI10)

Who	Subjects	Instances
Teacher and peers	427, 418, 423, 426, 431, 419, 428, 432, H(5) M(3)	Teacher was king in such a climate (427), total freedom as far as I was concerned (418), we had total freedom (423), basically you and your team determined what and how it was to be taught (423), areas to be taught were often interpreted differently by different teachers (426), never felt bound by one delivery strategy and I saw the syllabus as a minimum (419), syllabus—but interpreted differently by individuals based on own experiences (428), enormous degree of freedom—too much (432), State body of teachers (with some industry input) who met regularly and developed the course structure (913), the curriculum provides a broad guide and teachers decide on the specific content (910)
	913 917, 916, 910, 904 VH(4) VM(1)	
Senior teachers and peers	410, 423, 430, 408 H(3) M(1) 918 VH(1)	Decided at formal meetings (430), more guidance by STs then than now (408), locked into teaching program due to supplies, logistics (918)
Combination of senior teacher, peers and centralised body	405, 406, 407, 409, 434 915, 914, 912, 911, 909, 907, 906, 905 H(1) M(4) VM(7)	Senior teachers directed myself and other staff to teach to centralised curriculum (407, 409, 909, 907), curriculum branch, collective contribution of new and experienced teachers (434), combination of centralised curriculum and self (406), industry would recommend changes; TAFE would develop them (915), base curriculum set by centralised curriculum body with support from State-wide body of teachers; content of curriculum very much set by the individual teacher (914), State curriculum stated outcomes (912, 911), my job was to develop the 'how' the learning was achieved (912), course was controlled by curriculum development and equipment available (906)

Note: M = Qld Metals, H = Qld Hospitality, VM = Vic. Metals, VH = Vic. Hospitality.
In the left column, the source of influence upon teaching practice is stated. The centre column identifies the subjects and the right column provides instances that are illustrative.

Table 4.4 Responsiveness to syllabus prior to CBT (AI11)

Item	Subjects	Instance
Followed it faithfully	406, 407, 430, 428, 426, 418, 409, 918, 916, 914, 911, 910, 905, H(3) M(4) VH(3) VM(3)	To ensure consistency (406), minor deviations based on the equipment available and resources provided (432), awareness of audits (428), as a beginning teacher (426), usually you didn't go outside the syllabus except if there was a local environment that you were aware of (418), there is always the pressure to show that what you did is relevant to syllabus (409), what was expected—what was done (918), it was relevant and quite outcome focussed (916), to maintain a standard (914), clear statements of intent were included (911), to maintain a consistent level of training (905)
Guided by it sometimes	410, 432, 427, 423, 410, 434, 917, 913, 912, 909, 907, 906 H(5) M(1) VH(1) VM(5)	Good guideline of work to be covered (410), worked to the syllabus; an ideal document to go back to for revision; we didn't ignore the syllabus by any means (432), guided by it sometimes (427), I would often change the syllabus; I am a great believer that the syllabus is just a guide (423), guided by it sometimes; it was a good guideline of the work to be covered (410), because I was confident in its structure and the continued development to meets its requirements (434), written by people who do not know enough about industry so needed to prioritise differently (917), as long as the syllabus criteria was generally met—final results were determined by end-of-year exams (913), had no reason to do otherwise (912), material written was not right in a sense that there is more than one way of doing things (907), lack of equipment [to realise its worth] (906)
Considered it occasionally	408, 405 H(1) M(1)	Considered it occasionally; guided by it sometimes; because of the comfort with what you know, not what you should know (408), guided by it sometimes (405)

Note: M = Qld Metals, H = Qld Hospitality, VM = Vic. Metals, VH = Vic. Hospitality.
In the left column, the choices presented in the Likert scale are stated. The middle column identifies subjects and their association with those choices and the right column provides instances of evidence to illustrate and support the categorisation.

Table 4.5: Differences in antecedents

Item	Hospitality	Metals
Source of curriculum materials	Little was developed, teachers recruited for their expertise and used to provide material for curriculum documentation	Centrally developed documents and approaches to instruction
Interaction between source and teachers	Generated from teachers' knowledge	Handed down from a curriculum branch
Role of syllabus	More likely to be a guide for practice	A guide for practice but also to be implemented with fidelity
Teaching materials	More likely to be based on teacher-generated material	More likely to be based on externally developed materials
Curriculum role (Marland 1978)	Researchers, developers, adapters, implementers	More likely to be adapters, implementers

Table 4.6: Activities prior to and after the implementation of CBT

Activity	A regular part of practice prior to CBT	A regular part of practice since CBT	Reason for difference
Determining content for course	405, 407, 408, 409, 434, 918, 917, 916, 915, 914, 913, 912, 910, 909, 908, 907, 906, 905	405, 406, 409, 410, 918, 917, 916, 915, 914, 912, 911, 910, 909, 908, 906, 905	Required before but not after—module content is more restrictive (408), not required after CBT because courses were less flexible (407), pre-CBT determined by section and teachers, post—by modules because of audit requirements (406), no control, ITABs and ANTA have all the say, little input from teachers (434), course and content usually prescribed (918), varies—depends on module availability, who's funding, etc., same—content aligned to individual industry (914), not since CBT, CBT more structured (913) more since CBT—programs are more individualised (911), before external (STB) and after NMEC (909), not since CBT —national input (907)
Lesson planning	405, 406, 407,408, 409, 410, 434, 918, 917, 916, 915, 914, 913, 910, 909, 908, 907, 906, 905	405, 406, 407, 408, 409, 410, 918, 917, 916, 914, 912, 911, 910, 908, 90,	Required before CBT, but less so afterwards as information was contained in set modules (407), less, it's all laid out (434), not since CBT (915), less—because of students at different levels—more difficult (913), more so—now students and employers have greater say (912), more case of session planning as students engaged in different activities (911), not since CBT—no formal lessons (909), less since CBT (908), not since CBT—not necessary to lockstep (907), not since CBT—self-paced nature of the training doesn't allow for formal lessons (905)
Feedback to students	405, 406, 407, 408, 409, 434, 918, 917, 916, 915, 914, 912, 911, 910, 909, 908, 907, 906, 905	405, 406, 407, 408, 409, 434, 410, 918, 917, 916, 914, 913, 912, 911, 910, 908, 907, 906, 90	Not as much after CBT as before—with CBT—just need to draw a line between J/M—after students have passed no need to provide detailed feedback (410), less so afterwards as more research was carried out by students (408), more needed afterwards as college policy requires each student to be fully aware of the course presentation and assessment (407), more so after—enhanced due to amount of testing (406), much more—re-sits, more expected, less time (434), not since CBT—in the past a group went through and we helped individuals—now it is individualised (915), more to individuals since CBT—students at different levels (913), same, but students have greater expectations (912), not since, general work (909), more since CBT (908), more since—evaluation forms (907), constantly reviewing content (906), more since CBT—students now aware of their progress and cannot move on until competent (905)
Individualising learning	405, 406, 407, 408, 409, 434, 918, 917, 916, 915, 914, 912, 910, 908, 907, 905	405, 406, 407, 408, 409, 410, 434, 918, 917, 916, , 914, 913, 912, 911, 910, 909, 908, 907, 905	Very little done prior to CBT except for assignments (410), more so after CBT—with checking on all skills as they developed (408), more so after with more modules and less students per module (406), more work expected to be covered reduces ability to control process (434), still prescribed exercises, texts (918), more so now (917), more since CBT no longer set curriculum to achieve end results—student input required (914), more since CBT because more structured (913), more since, individualised programs (911), more since CBT—self-paced (909), more since (908)
Group work	405, 406, 407, 408, 409, 410, 918, 917, 916, 914, 913, 912, 911, 910, 909, 906, 905	405, 406, 407, 408, 409, 410, 918, 917, 914, 913, 912, 911, 910, 906, 905,	Less satisfactory now—too outcomes focussed (917), not since CBT—more difficult to work in groups (916), less since—minimal (913), not since CBT—social change (912), less so as students are on individual work (911), no uniform structure (909), not since—self-paced (907), less since CBT applied more in demonstrations on machinery (906), less since, group work becomes more difficult when individuals are at different levels etc. (905)

Table 4.6: Activities prior to and after the implementation of CBT continued

Activity	A regular part of practice prior to CBT	A regular part of practice since CBT	Reason for difference
Program planning	405, 406, 407, 408, 409, 434, 918, 917, 914,916, 913, 912, 911, 910, 909, 907, 906, 905	405, 406, 407, 409, 410, 434, 917, 916, 914, 913, 912, 911, 910, 906, 905	Required before but not after—as CBT is less flexible (408), continual changes to content—trying to blend modules (434), not since CBT (918), less—a little more difficult due to student level of progression (913), more since—to be industry specific, not generic (912), now more varied (911), not since CBT (909) not since—set curriculum (907), less since CBT—no start or finish to a program as it continues to start and finish at all stages (905)
Promoting independent learning	405, 406, 408, 409, 410, 434, 918, 917, 916, 914, 913, 912, 911, 910, 909, 908, 907, 906, 905	405, 406, 407, 408, 409, 410, 917, 916, 914, 913, 912, 911, 910, 909, 908, 907, 906, 905	Not as much after CBT because the line is drawn between J/M (410), more so afterwards as more research was carried out by students (408), required afterwards as each student is monitored on each learning outcome for each module (407), more so after more modules, less students per module (406), lack of resources—less time for this (434), not since CBT—course management works against independent learning (918), more so since CBT—flexible delivery materials more readily available (917), system allow students to dictate a path to achieve the same end results (914), more—more individual info in their books (913), now tends to be print-based—depends on literacy levels (911), more since CBT —self-paced (909), more since (908)
Keeping student records	405, 406, 407, 408, 409, 410, 918, 917, 916, 914, 913, 912, 911, 910, 909, 907, 906, 905	405, 406, 407, 408, 409, 410, 434, 918917, 916, 914, 913, 912, 911, 910, 909, 907, 906, 905	Much greater requirement after CBT (410, 434), heaps more after because of auditing, quality assurance and general need to keep a hard copy (408), since CBT is far more detailed and accountable (407), more so after—each outcome is tested, the results must be kept along with the module results (406), detailed outlines required (916), more—a lot more complex (909), easier now with computer management system (907)
Finding time to assess students' work	405, 406, 408, 409, 410, 434, 918, 917, 916, 913, 912, 911, 909, 908, 907, 906, 905	405, 406, 408, 409,410, 434, 918, 917, 916, 914, 913, 912, 911, 910, 909, 908, 907, 906, 905	Less so after CBT as computer-based testing reduced this demand (406), greater requirements (434), more since CBT, wider variety of assessment to be undertaken in less designated time (914), has increased since CBT (910), less—less teaching time due to administrative tasks (909), less since (908), more since—because of individual needs (906)
Reviewing curriculum	405, 409, 434, 918, 917, 916, 914, 913, 912, 910, 907, 906, 905	405, 409, 917, 916, 914, 913, 912, 911, 910, 906, 905	Not required before or after (406, 407, 408, 410), teachers excluded from reviews and development (434), not since CBT—tends to be remote 1999—no local content (918), now totally controlled by others (912), more often since CBT—user pays (911), not since CBT—done by national input (907), more since (906)
Monitoring learners' progress	405, 406, 408, 409, 410, 434, 918, 917, 916, 914, 913, 912, 911, 910, 909, 907, 906, 905	405, 406, 407, 408, 409, 410, 434, 918, 917, 916, 914, 913, 912, 911, 910, 909, 907, 906, 905	More so after CBT because of skills audits (408), required after as students must achieve all learning outcomes to achieve competency (407), more so, modules broken up into small outcomes, now more obsessive (912)

Table 4.6: Activities prior to and after the implementation of CBT continued

Activity	A regular part of practice prior to CBT	A regular part of practice since CBT	Reason for difference
Managing the learning environment	405, 406, 407, 408, 409, 410, 434, 918 917, 916, 914, 913, 912, 911, 910, 909, 907, 906, 905	405, 406, 407, 408, 409, 410, 434, 918, 917, 916, 914, 913, 912, 911, 910, 907, 906, 905	CBT requires more which haven't been supplied (408), less so after, as student outcomes need to be formally assessed (434), more complex now, wide range of facilities required (911), not since CBT (909)
Monitoring and evaluating performance	405, 407, 408, 409, 410, 434, 918, 917, 916, 914, 912, 911, 910, 909, 907, 906, 905	405, 406, 407, 408, 409, 410, 434, 918, 917, 916, 914, 913, 912, 911, 910, 909, 907, 906, 905	Post CBT more accountable and detailed (407), not required before, after because of audit requirements (406), more since CBT—students monitored in every area of work, to a standard (912)
Promoting students' acceptance of responsibility	405, 406, 407, 409, 410, 434, 918, 917, 916, 914, 913, 912, 911, 910, 908, 907, 906, 905	405, 406, 407, 409, 434, 917, 916, 914, 913, 912, 911, 910, 908, 907, 906, 905	Not required after—with three-chance approach to assessment, students are more inclined to fail first assignment knowing they have two more attempts (410), more so, less time to assist students (434), not since CBT, perception of responsibility (918), more so since CBT because of flexibility regarding deadlines (917), less since CBT more difficult—questioning content relevance etc. (916), now learning competency undertaken instead of to whole life (912), more since (908), more since CBT—more theory—freely available to reinforce (907)
Involving students in self-evaluation	405, 406, 407, 408, 409, 410, 434, 918, 917, 916, 913, 911, 910, 909, 907, 906, 905	405, 406, 407, 408, 409, 410, 434, 917, 916, 913, 912, 911, 910, 909, 907, 906, 905	More so afterwards because tolerances are given for most aspects (408), very little since CBT (918), more so—many more learning outcomes to assess—self assessment (917), more limited since CBT—competency assessment (912), more since CBT—computer assessment at the end of each module (907)

Table 4.7: Responsiveness to syllabus after CBT (PC2)

Item	Subject	Instances
Followed it faithfully	406, 407, 409, 410, 426, 428, 433 H (4) M (2) 918, 916, 914, 913, 911, 910, 909, 907, 906, 905, VH(3) VM(7)	CBT requires greater concentration on students becoming competent. Prior to CBT, education of the student played a role (433), need to be more specific and address each learning outcome—can be extensive and challenging to achieve—but not impossible! (428), I think the criteria for assessment is more clearly defined (426), the auditors 'stick' seems to be getting bigger (410), post-CBT, there is a clearer breakdown of learning outcomes (409), because the focus is now fixed on each student in performing set tasks (406), we don't use the full CBT program (916), national curriculum after 1992 for national consistency (918), pre-packaged in large bundles and assessment in two stages (916), with CBT it is more structured and students complete their tasks in small packages (913), the outcome of both was to achieve that competency (907), wider range of subjects within national syllabus (906)
Guided by it sometimes	405, 408, 427, 430 H(2) M(2) 917, 912 VH(1) VM(1)	Funding and resources don't allow strict adherence now, but try to follow the prescription; we sometimes incorporate more up-to-date topics and methodologies, practices and technology than described in the syllabus document (430), greater emphasis on mechanical tasks, procedures and skills with downgrading of analysis and problem-solving (427), we are now audited, management has a fear of losing the subjects, so the auditing has the effect of making the staff stick more to subject (408), details relating to assessment much more extensive since CBT; a greater emphasis on more activities since CBT (405), stronger focus on outcomes per modules—more assessment per module (917), because we have auditors we need to be seen to follow the rules of the (indistinct); it quite often misses the outcomes we are aiming for (912)
Considered it occasionally	434 M(1)	Not given opportunity to have input, saw problems, soundness of processes (434)
No change	423 H(1) 904 VH(1)	Thought we were doing it

Note: M = Qld Metals, H = Qld Hospitality, VM = Vic. Metals, VH = Vic. Hospitality.
In this table, the responses to the Likert scale are reported in the left hand and centre columns. Instances relating to these responses are indicated in the right hand column.

Table 4.8: Effects of accreditation on teachers' work (PC3)

In what way	Subject	Instances
Reporting activities	431, 425, 424, 422, 415, 414, 413, 412, 411, 408, 400, 434 922, 921, 918 M(7) H(5) VM(2) VM(1)	A lot more record keeping required now (431), there was a lot involved in that, an awful lot of work. But if you did it properly, it was worth it (424), provide a means for the validation of training within industry; trainers more accountable; greater number of records and more details. Audit track of training needed (416), lots more paperwork. It was time consuming but much more thorough (411), there seemed more documents to complete to justify your ability to teach certain subjects RPL, cross-accreditation, challenge testing and re-sitting assessment systems (434), more record keeping (922, 921)
Registration process	431, 428, 427, 423, 422, 418, 414, 413, 412, 432 920, 917, 918, 916 VH(3)	Teachers required to have a trade qualification, appropriate teacher training and a minimum of five years of industry experience, currency through a release to industry program; physical resource statements of typical workshop equipment (431), setting up profiles, upgrading profiles, it was very difficult to convince teachers who had been around for a long time, that they needed to change, that they needed to learn something new (423), more time spent providing paperwork to meet auditing requirements (434), forced compliance to the administrative system, not the workplace (920), introduction of standards, context statements and checklists (918), more development of courses; more work—permission to run State courses (917), change assessment; designated providers (916)
Teaching practice	431, 407, 401, 419, 923, 921, 917, 914, 913, 912, 911, 907, 906 M(3) VH(7) VH(1) VM(8)	Assessment (431), minimise amount of content (407), greater workplace focus (419), reduced contact with students (434), parts of the old curriculum were lost (923), more emphasis on developing skills (921), more development of courses (917), modular work to unitised work; RPL of individuals; assessing of individuals' prior skills (914), it made it quite difficult to plan the teaching methods for individual students (913), modules became more fragmented ... in a bid to become more 'stand-alone' they became more repetitive. Focus is on completing each module rather than learning an overall skill (911), more of a facilitator than a teacher; less group work; became more versatile and conversant with a whole new range of subjects (907), the broad-base subjects caused new learning (906), commenced training students that were from a different trade background (905), job satisfaction diminished, I became an instruction of bodies, not people (912)
Professional development	426, 409, 404, 403, 402, H(4) 907, 906, 905 VM(3)	We all went out frantically seeking work to gain currency! I was OK, but other teachers who had no currency, were told they weren't allowed to teach in that area (426), there is more pressure on people to be up-to-date with qualifications (409), required to complete, and train in the trainer course (404), became more versatile and conversant with a whole new range of subjects (907), the broad-base subjects caused new learning (906), commenced training students that were from a different trade background (905)
No change	433, 430, 420, 410, 406	Simply modified old practices to fit new structure (430)

Note: M = Qld Metals, H = Qld Hospitality, VM = Vic. Metals, VH = Vic. Hospitality.

Table 4.9: Evidence of the educational worth of CBT (OS1)

How	Evidence (subject)
For the better	CBT seems to have bred real teachers rather than craftsmen who teach (432 HT), portability of outcomes, improved assessment—acceptance of competency-based approach (431 MT), assessment on the job [improved validity] (429 I)—greater accountability and documentation —more focussed on outputs—assessment on the job (425 HCO), on-the-job training [relevance] —more structured, clear path to follow (424 E), fairer—not waiting for others, flexible delivery, individualised instruction (422 MI), on-the-job assessment, self-paced (421 HE), specific content being learnt—more industry control over what is taught (420 ME), testing to and achieving a higher standard (418 MT), provides building blocks [curriculum structure]—greater choice and on-the-job training leads to increase in workplace skills (412 HI), you know they've completed the course—less time in college (411 HE)
For the worse	Demotivates students (423 HT, 432 MT), no recognition for students who excel (423, 422), uncertainty of non-graded pass (423, 431), lack of reward in non-graded assessment (431), more difficult to sustain private providers due to reduced off-job time (422), expediency in assessment practice might occur [validity/reliability of assessment] (421)

Table 4.10: Benefits of CBT

Benefits	Subjects
Portability of outcomes	431
Broader acceptance of competency standards	431
Use of competency standards	429, 418
Greater accountability	425, 421, 411 (e.g. apprentices being assessed on the job)
Individualised instruction	422
Cost effective approach	422, 421, 411
Specific content	420
Currency of content (TA)	412

Table 4.11: Concerns about CBT

Concerns	Subject
Motivation of students	431, 423
Determining excellence	431, 423, 422
Expediency in workplace provisions	

Table 4.12: Productivity of relationships among industry, teachers/trainers and trainees (OS2)

Productive factors	Industry/enterprises		Teachers/trainers		Students	
	H	M	H	M	H	M
Greater interaction between parties	412	420	423, 414, 413, 410, 409, 405, 404, 403, 402	430, 400, 434, 906	138, 137, 133, 125, 110, 65, 58, 52, 42, 34, 1, 724, 722	70, 758, 757, 755, 753, 751, 749, 746, 745, 737, 736, 735, 732, 521, 516
Employers' training needs met	421, 412	429, 422, 420	414	418, 417, 416, 407, 922, 921, 920, 919, 914, 907	15	
Development of students			414	901	189, 184, 57, 20	153, 91, 514, 508,
Enhanced relevance (students and industry)	411				137, 135, 118, 19, 17, 11	84, 78, 77, 733
Expertise of trainers			916		127, 126, 106, 39, 38, 23	80, 71, 702
More productive (non-specific)					717	743, 740, 738, 734, 705, 703
Emphasis on workplace learning			427, 402	417, 907	144	744
Greater choice of subjects for students/employers				418, 416, 913		502
Use of industry standards			403	416, 415	135, 116, 48, 35	706
More flexibility in delivery				416, 415		87
Career paths for students	412			416, 901		
Learners' needs met					117	99, 75
If implemented fully all benefit				431, 40		
Students have greater responsibility				430, 901		

Table 4.12: Productivity of relationships among industry, teachers/trainers and trainees (OS2) continued

Non-productive factors	Industry/enterprises		Teachers/trainers		Students	
	H	M	H	M	H	M
Content not relevant to workplace					41, 27, 15, 14, 716	173, 169, 160, 159, 158, 154, 92, 82, 74
Little genuine interaction				408, 434	143, 12	152, 748, 518, 509
Not meeting students' needs			413	903	25, 4	103, 101
Students not taking responsibility for their learning				430, 418		
Confusion about what CBT is (and constant change)	425		426, 409, 405			
Dependency on standards that differ				428		527
No relationship				433	190	152
Overemphasis on industry's contribution			426	406		
Too much bureaucracy	425					
Unfair dealing by ITABs			423			
Pace of learning too great						176, 172
Inconsistent application of standards					48	94
More access to trainers						80
Non-graded pass reduces motivation for excellence			432		6, 5, 2	
Workplaces aren't providing appropriate experiences					46, 13	711
More access to college facilities					16	
Lack of reliability in assessment				434		
Not meeting industry needs			923			
Focus on market rather than education			917	912, 911		
Employers want ranking			916			
Students under informed						754
Unproductive (non-specific)						527, 514

Table 4.13: Interactions promoting the skillfulness in trainees (OK16)

Interaction	Subjects	Instances
Curriculum negotiations	429, 421, 422, 424, 431	Provider knowledge of industry needs, realised through curriculum negotiations (429, 421, 422), regular interactions develops awareness (424), negotiated options between trainees, trainers and industry as to how and where and the sequencing of when skills are developed, to avoid duplicating what they learn on the job (431)
Industry placements	432, 425, 418, 421	You've just got to be out there doing it (432), it keeps the trainers in touch with industry requirements (421)
Networks (formal informal)	423, 412	The TTQ regional network is important here (412)
Employers' understanding of teachers	425	Successful teachers are very often the ones that can introduce students out into the workplace and even work alongside them; it's a two-way street (425)

Table 4.14: Achieving uniformity through CBT (OS4)

Achieving uniformity

	I/E		TR		Instances
	H	M	H	M	
Use of designated competencies	425	424	428, 413, 405, 923, 917, 916	433, 434, 409, 906	CBT has allowed for uniformity due to the prescriptive nature of the learning outcomes (405), everyone working to a standard. But the trainer has different interpretations of competence (404), quality still dependent on assessor (923), but the fun has gone out of it; students are less motivated, less disciplined, less committed. Good has been industry focus—assessments under industry conditions (917), in the beginning (434), uniformity is probably better, because the learning outcomes are clearer (409), broader knowledge of training (906)
National curriculum documents	411	424	431, 923, 900	406, 913, 900	Standard tests, workbooks and projects (406), through national modules (913), content of modules the same (907) national curriculum, greater consistency of delivery (900)

Not achieving uniformity

	I/E		TR		Instances
	H	M	H	M	
No guarantee of uniformity		429	427, 426, 410, 404, 403	430, 433, 401, 434, 905	Different applications of quality (429), everyone has different ways of doing things (426, 434), different interpretations (410, 434), it is not being measured (433), it is now national, but the module books printed in each State use different resource material, and so place a different emphasis (408), everyone working to a standard. But the trainer has different interpretations of competence (404, 434), only as good as the training environment and instructors (905)
No uniformity	904	419, 903	423, 414	416, 430, 922, 921, 920, 914, 912, 911, 909, 902	A moderation system would be needed (418), because there are so many players uniformity is impossible (415), no uniformity of practice (414), curriculum in constant state of flux (922), metal trades too extreme to expect uniformity (921), great variation of need (920), more complexity, no greater uniformity (914), training is fragmented (912), emphasises individuals and individualised programs (911), diversity of students means there will always be differences (904), content might be the same but all else is different (903), no change in level of uniformity (902), we do not communicate with our colleagues in other institutes (430)
Not desirable		420	402	416, 920, 919	Needs of enterprises differ (420, 416, 402), no subservience to overbearing bureaucracy (920), needs of enterprises differ (919)

Table 4.15: Factors contributing to CBT realising enterprise and industry goals (OC7)

Factors contributing to goals	Industry/enterprises		Teachers/trainers		Students	
	H	M	H	M	H	M
Enterprises have skills they require	900	420	923	431, 418, 921	190, 67, 720	99, 76, 749, 744, 739, 737, 705, 515, 503
Customisation of enterprise needs/enterprise input		429, 422	917	922, 920, 919, 913		755
Responsive to industry standards	421		414, 413, 412	406, 907	192	
Increased numbers of trainees		417		905	21	
Workplace learning components				416, 415	112, 63, 15	96
Multi-skilled students			414		191	175, 87, 83, 509, 502
Yes (non-specific)					144, 128, 127, 118, 65, 57, 34	81, 501
Good for individual learning					138, 137, 110, 108, 66, 56, 52, 39, 23, 17	92, 84, 77, 71, 70, 521
Takes less time				434		757
Repeat business	904			922, 921		
Greater choice of providers				430		
Student competence				913, 906		508

Table 4.15: Factors contributing to CBT realising enterprise and industry goals (OC7) continued

Factors not contributing to goals	Industry/enterprises		Teachers/trainers		Students	
	H	M	H	M	H	M
No/little evidence		902	426, 423, 405, 918	433, 914, 912, 911, 905	135, 134, 133, 132, 130, 126, 125, 55, 50, 49, 41, 40, 29, 26, 25, 20, 14, 11, 10, 6, 727, 726, 724	173, 172, 170, 168, 163, 161, 160, 159, 158, 157, 156, 154, 152, 151, 149, 104, 103, 98, 97, 94, 90, 89, 82, 77, 71, 74, 72, 754, 752, 743, 714, 704, 703, 530, 529, 522, 51
Employer dissatisfaction/confusion	425	424	432, 923	920		
Diversity of needs			428, 427			
Limited feedback			409	408		701
Theory not learnt						167
More emphasis on workplace						160
Not relevant?		902			46, 27, 12, 2, 1	
Employers not interested in training						733

230

Table 4.16: Achieving competitiveness through CBT (OC6)

Evidence that competitiveness has improved

Evidence	E/I		TR		Instances
	H	M	H	M	
Multi-skilling			414	431	Having a multi-skilled workforce makes enterprises more competitive (431)
Workplace-based				416, 415	On-the-job instruction, when properly delivered, will improve overall efficiency (417), specific expertise and equipment required (415)
Enterprise needs met	421, 412, 411	422,418	923	431, 400, 920, 919	Workplace focus improves competitiveness (431), employers more empowered (422), training conducted within the industry is more relevant (421), tailoring training to enterprise needs (418), improved quality of service (411), low end of the market being met (923), needs met (920, 919)
Student competence				913, 906	Student competence (913, 906), also promotion of students (906)
Choice in providers			918	430	Choice in provision (430)
Improved access to training		429	917	417	Production employees can access training and career progression (429), more trainees (417), high levels of flexibility (917)
Enhanced relevance			413	406, 922	Industry involvement and support (413), more input (922)
Repeat business				922, 92	Sending their apprentices back to us (922, 913)

Evidence that competitiveness has not improved

Evidence	E/I		TR		Instances
	H	M	H	M	
No/little evidence	425		432, 427, 426, 423, 405	433, 408, 914, 911, 905, 902	More input from industry (426)
Diversity of needs			428	400, 912	Diversity of enterprise needs makes it hard to please all parties (428), no system can satisfy all needs (912)
Training not important		420			Individuals' attitude the most important factor (420), industry needs met, but not those of individuals (400)
Negative outcomes				434	Concerns about outcomes leading to increased workplace injuries and fatalities (434)

Table 4.17: Processes and outcomes of independent and collaborative problem-solving (OK15)

Process factors	E/I		TR		Instances
	H	M	H	M	
Group problem-solving activities			432, 427, 426, 402, 918, 917, 916	430, 921	Less competitive environment permitted groups activities(432), however, group activities negate efforts to assess individual competency (430), team work in practical tasks (427, 426), collaborative (434) group dynamics developed and practised (922), by working together in teams and taking responsibility (921), teams and team assessment—need to work together (917)
Self-managed instruction				431, 407, 434, 922, 913, 909, 907	Interactive learning resources (431), allowed more individualisation (434), by researching their own information with minimal assistance (913), computer-based learning (909), library resources (907)
Project work	425	429		903	In spite of CBT, not because of it—project work (429), by working together in teams and taking responsibility (921), diagnosis of faults etc. (903)
Rote learning		422	423		Students learn by rote rather through problem-solving (423, 422)
Learners isolated			409		Trainees often learn in isolation (409)
More interaction	421			907, 906	More interaction in their learning (421), interaction with teachers/peers (907)
Too much support		420			Everything done for them, no longer adaptable (420)
Happening informally				418	Happening in delivery strategies, informally (418)
Happens in the workplace			414, 923	416, 415, 920, 903	By dealing with real life problems they learn to cope (414), in the workplace where employees are expected to solve problems all the time (923), workers in industry are engaged in problem-solving on a daily basis (920)
Student disposition/ attributes		902		406, 911	Depends on student (406), depends on trainees (911), depends on individuals (905), they can work out when they need to (902)
Teachers' approach			404, 916	919	Need to consciously use p-s strategies (920)
Timelines and standards				921	
Taught how to p-s				920, 919, 911, 903	Training assisted in systemising the process, documentation and reporting (920), can be structured to and facilitated to develop individual and collective p-s (919), taught in courses (903)
Lacking resources				434	Not enough resources for accelerated learning (434)

Table 4.17: Processes and outcomes of independent and collaborative problem-solving (OK15) continued

Outcome factors	E/I		TR		Instances
	H	M	H	M	
No change	421		413, 910 410, 405 400	430, 418, 914, 912, 408	Not evident in trade courses (418), they always have, what has CBT got to do with it? (912), not part of CBT, done in schools (400)
Initiative		424			They don't tend to need help so much (424)
Limited ability		422	423	401	Haven't learnt problem-solving (423, 422), have limited view about problem-solving (401)
Collaboration	421				Better able to work collaboratively (421)
Got worse		420	403		Individuals' attitudes work against adaptability (420), get more through schooling than CBT
Outcomes set for p-s				919	Competencies need to be conceived holistically and within context (919)

Table 4.18: Processes and outcomes of independent and collaborative problem-solving (OK15)

Process factors	ST		Instances
	H	M	
Group problem-solving activities	189, 9, 8		Team work (9), working with a variety of people (8)
Self managed instruction	185		Reading books (185)
Happens in the workplace	18	175, 170, 169, 714, 705, 504	Everyday in the workplace (175), at work using trade training (170), my job is large part of my training (714), working out jobs at work (504)
Guided by expert		89, 757, 702	Guidance by experienced person highly effective approach (89), work machines without supervision (757, 755), advice by teachers has allowed me to solve problems (702)
Just doing it	191	82, 754, 738	That's all we do (82), how to use machine (738)
Training program helped	146, 142, 134, 126, 113, 110, 109, 108, 67, 65, 58, 51, 48, 47, 42, 39, 36, 31, 22,20, 16, 15, 720	160, 147, 94, 80, 76, 70, 745, 739, 735, 522	Experience from training has certainly helped (160, 76, 22), wide range of knowledge e.g. working out angles (147), helped dealing with public (146, 142, 65, 42, 27, 20, 16, 15), at home on my own work (94), gaining experience through training (80), gave confidence (70, 31), people ask for my help because I have been to college (67, 51), helped solve problems on my own (51), roller door broke—fixed it up using skills I learnt at work and at trade school (745), helped me operate machines I couldn't (735)
Yes (no instances)	144, 81,63, 34	154, 148, 104, 73, 743, 737, 704	
Applying at work what you learnt in course	50, 13, 2	103, 98, 75, 71, 734, 732, 516, 512, 501	At work, you apply what you learnt in TAFE (103), applied what I learnt in college (13), I can start machines at work I never could before (732), able to perform jobs at work, learnt at school (501)
Approach to work		714	It helps if I take the attitude I have at work—things get done (714)
Interacting with others		757, 753, 739	Being able to communicate with others (757), communication, organisation (753), you sometimes need someone to help you (739)

Table 4.18: Processes and outcomes of independent and collaborative problem-solving (OK15) continued

Outcome factors	ST		Instances
	H	M	
No	190, 138, 135, 133, 132, 130, 125, 46, 45, 41, 39, 29, 27, 14, 12, 10, 6, 727, 724	173, 172, 168, 165, 163 161, 157, 156, 151, 149, 96, 77, 74, 72, 736, 521, 518, 513, 509, 508, 502	Not enough preparation has occurred (172), too narrow impractical (157), can't provide examples (163)
Lack of opportunity		159, 158	Not using it in workplace (159, 158), not relevant (703)
Understanding	143, 137, 65, 35, 26, 20, 17	176, 152, 92, 91, 87, 748, 70	Numerous instances where knowledge has helped me understand (152), if you understand what you are doing it helps (143, 87), using basic principles (92, 91), understanding how to deal with complaints (65), understand about the industry (35), understanding what wine and when (26), knowing the correct procedures (17), the more you learn the more you know (701)
Experience and knowledge	184, 129, 1		To be trained and prepared (129), doing things we would do in the workplace (1)

Table 4.19: Evidence of an ability to transfer (OK18) (Industry/enterprise/teachers)

Evidence supporting ability to transfer	E/I		TR		Instances
	H	M	H	M	
Transfer across workplaces	421, 412		432, 423		Students work in a variety of establishments (432, 423), and workplace roles (421), adapting customer service to different cultural settings (412)
Adapt to innovations		424			Trainees can adapt to new technology and demands of the workplace (424)
Standardised work practice			425		Standardised work practices eases transfer (425)
Individual factors			423		Depends on the individual (423)
Transferring basic skills across different settings	412 411, 904	903			Advise about different ways of doing things—need to adjust to the outcomes of a particular establishment (904), learn basic principles and processes by which to transfer (903), working on different vehicles (902)

Evidence contesting ability to transfer	E/I		TR		Instances
	H	M	H	M	
Work contextualised		422			Skills developed specific to the workplace (422)
Not associated with CBT		429			CBT is about assessment, not instruction and transfer (429)
Individual factors		420	423		Skills and attitude of apprentices are lacking (420)
No evidence		420		418	System is flexible, but not the learning (420), not at trade levels (418)

Table 4.20: Evidence of an ability to transfer (students)

Evidence supporting ability to transfer

	ST		Instances
	H	M	
Applying basic skills in different settings	189, 134, 112, 110, 108, 64, 56, 55, 52, 51, 50, 40, 39, 27, 23, 20, 13	89, 751	Use hygiene and health and safety rules (189, 23), learning about organisation skills useful in all areas of life (110), do not need to be trained as much as others (64, 56) transferring skills across workplaces (52, 39, 27), different workplace requirements (50, 40), basic skills transferred (751)
Applying skills to workplace	184, 117, 116, 61, 60, 53, 51, 38, 37, 36, 720	169, 95, 80, 753, 748, 702, 701	Doing the job shows the training has helped (184), transferring from college to workplace (116), everyday at work (95, 60, 753), doing tradespersons' work (80), training program allowed transfer (37, 36), better workplace knowledge (748)
Understanding	137, 69, 65, 54, 26, 9	176, 175, 76, 75, 66, 737, 735, 733	Learning PLCs has helped (176), have guidelines to work with (175), dealing with customers (137), you remember the theory behind the components and so can fix them (75), understanding needs (69), understanding functions (66), understanding about the workplace (54), training helped me transfer skills (32), understanding of wine (26), can do harder work as a result of training (737, 735, 733)
Develop further skills	128, 51, 25, 14, 11	147, 101, 92, 737	Developed social skills and responsibility (128, 25), explaining what I have learned to others (118, 92, 51, 11), quicker at work and less pressure (101)
Learning in the workplace		89, 508, 15	On-the-job training Yes, CBT No (89) most learning in workplace (15) previous work experience (508)
Yes (no instances)	144, 81, 63, 34, 33, 7	154, 152, 104, 98, 73, 739, 706, 531, 516, 501	

Evidence contesting ability to transfer

	ST		Instances
	H	M	
No evidence	138, 135, 133, 132, 130, 129, 67, 29, 22, 16 10, 1 727, 724	173, 170, 165, 163, 161, 159, 158, 156, 153, 151, 149, 103, 94, 82, 77, 74, 72, 754, 735, 702, 522, 521, 50	
Quality of training		172	Not enough depth or duration in training (172)
Rarely		96	
Don't use it	41	739	Don't use the skills learnt (41), training pointless for us in our job (743)

Table 4.21: Alternative approaches to instruction (F11)

	E/I		TR		Instances
	H	M	H	M	
Use appropriate strategies	421	422	427, 402, 923, 919, 917, 413, 428, 404, 40	400, 911, 909, 417, 922, 921, 920, 906	Use strategies appropriate for the task, not because they are fashionable (427), training in both theory and practical (402, 400), change the modular type instruction so that they don't do it and forget it (421), team-based assessments, incorporating workplace relevance (923, 919), more focus on learning (917), greater variety of methods (911, 417), develop peer responses groups (909), more problem-solving skills (413), more practical learning, role plays, project work, hands-on learning (404, 403, 921), more hands-on project work—teach trainees how to think/process information (922, 919, 906, 904), use action learning techniques (920), more teaching and less self-paced learning (422)
Understand and respond to students' needs	411		409, 917	431, 430, 416, 434, 912	Understanding learning styles of students (431), and adapt to needs (431, 912), support students struggling with self-pacing (430, 409), cater for students' attitudes (416, 917, 411)
More interactive processes		424, 922		433, 907	More interaction (433),contact between providers and students (424), more student group and individual interaction (907), more teacher assistance (902)
More workplace learning	425		414, 923, 904	415	Workplace experiences effective (425), workplace and institutionalised preparation (415, 904), more workplace-based problems (414) requirement to complete work placement (414), incorporate workplace into teaching and assessment processes (923)
Thorough piloting of initiatives			915	431	Piloting of initiatives before widespread implementation (431), resources, professional development (915)
Maintain teachers' currency				431, 408	Provide ongoing professional development for staff (431), teachers to be current in content knowledge (408)
Be clear about goals			423	914	Determine the focus (high–low standard) and teach to that (423), emphasis on education less on finances (914)
Good as it is		420	426, 410	418	
Improved learning resources			915	408, 911, 914, 906	Better resource material related to subject (408), more resources of all types (911, 906), resource training facilities with equipment comparable to industry (914), class sizes reduced, more one-on-one contact (906)
Interview students			918, 916		
More time in college			432		Shortening of courses limits student development (432)
Holistic goals first				406	Start with end product, then components of the product. We now teach the components, then combine them in a finished product (406)

Table 4.22: Alternative approaches to curriculum development (FC3)

	E/I		TR		Instances
	H	M	H	M	
Collaboration among industry, enterprises and educators			410, 409, 405, 918, 917	415, 414, 408, 400, 912, 911, 906	Collaboration among industry, enterprises (400), and educators (415, 414, 408, 405, 912, 911), and community (410, 409), more involvement by small business (918), interactions between providers and enterprises—industry has a lot to learn from training providers as they don't necessarily encourage broad views in their staff—avoid credibility problems (917), material development constructed with consultation with industry (906)
Determination of enterprises' needs	425	424, 422	428, 426, 423, 402	431, 406, 922, 919, 913	Findings ways of determining enterprises needs (431, 424, 402, 913), gain commitment through ongoing and productive consultation with enterprises (428, 406), local input (425, 423), as with NETFORCE (422), flexible work tasks, tailored to suit individual company needs (922), curriculum locally relevant and meeting particular workplace needs (919)
Involve educators in curriculum development and implementation		420	427, 916	418, 434	Involve educators and the contributions from their professional practice (427, 434), industry not skilled with teaching and assessment (420), secure transferable outcomes as well as enterprise specific goals (418), involve trained teachers more (916, 911)
Determination of industry need	421	420		433, 417	By examining industry needs (433, 420, 417), it has to flow from industry (421)
Instructors' knowledge			432		Employ more industry-based people to teach (432)
Adequate resourcing and implementation				430, 921	Provide enough resources to do the job properly; allow time for the system to bed in and work before introducing further changes (430)
Greater standardisation of curriculum material			413, 923	416, 407	Industry (nationally) to develop the competency; standardise resource material; make trainers more accountable to industry needs and standards (416), national industry-TAFE links (407), avoid varied interpretation of enterprise standards (923)
Improve instruction			404, 403	434, 920	Incorporate more practical learning, self-paced learning and graded passes (404), more focussed instruction on students' needs (434), using integrated, contextualised, enterprise-based, experiential methods (920)
Independent arbiter			405	400	Independent arbiter to maintain collaborative relationships (405, 400)
Increase work placements			432		Replace apprentices on college release with college-based students (432)
Educate industry on structured training				921	Educate industry in the need for proper structured training, encourage governments to push industry into CBT assessment (921)

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